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January 31, 2014

Docket Control
Arizona Corporation Commission
1200 West Washington
Phoenix, Arizona 85007

RE: Arizona Public Service Company Ten-Year Transmission System Plan
Docket No. E-00000D-13-0002

In compliance with A.R.S. § 40-360.02, enclosed please find Arizona Public Service Company's ("APS") 2014-2023 Ten-Year Transmission System Plan for major transmission facilities (Attachment A), which includes the internal planning criteria and system ratings as required by Arizona Corporation Commission, Decision No. 63876 (July 25, 2001) and the Renewable Transmission Action Plan (Attachment B).

> IT IS FURTHER ORDERED that Transmission Owners are required to file, with their Ten-Year Plans, internal planning criteria and systems rating with limiting elements identified. (Decision No. 63876, p.3).

The 2014-2023 Ten-Year Plan describes planned transmission lines of 115 kV or higher that APS may construct over the next 10 years. This Ten-Year Plan includes approximately 191 miles of new 500 kV transmission lines, 78 miles of new 230 kV transmission lines, 6 miles of new 115kV transmission lines, and 7 bulk transformers. The APS investment needed to construct these projects is currently estimated to be approximately $496 million. These new transmission projects, coupled with additional distribution and sub-transmission investments, will support reliable power delivery in APS's service area, Arizona, and in the western United States.

If you have any questions regarding this information, please contact Greg Bernosky at (602)250-4849.

Sincerely,

Lisa Malagon

LM/cd

cc: Janice Alward
Steve Olea
John Foreman
Brian Bozzo
Terri Ford
Patrick Quinn

Arizona Corporation Commission
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Attachment A

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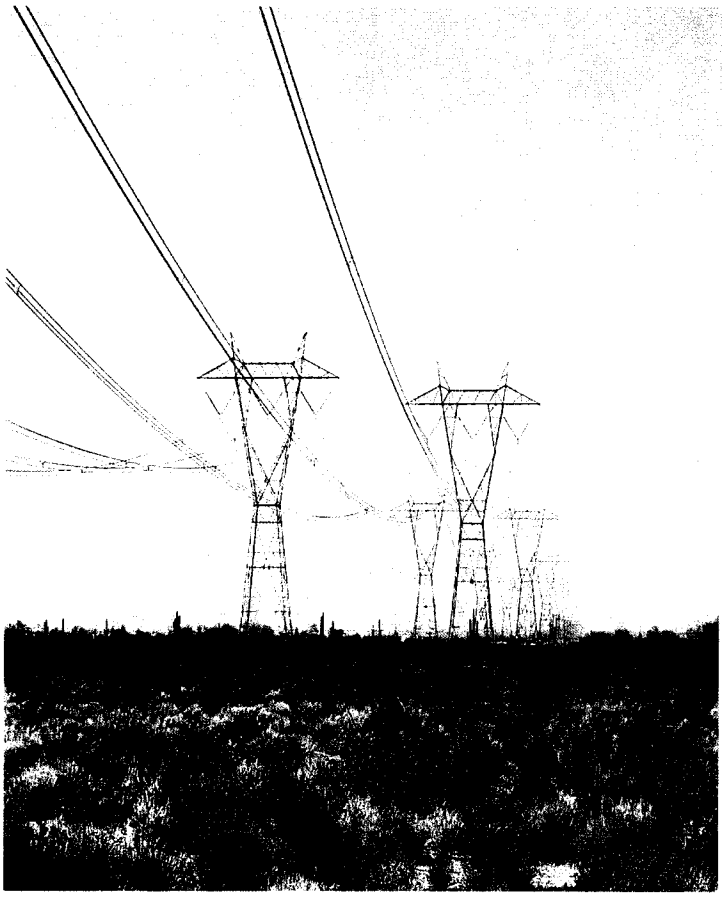
ARIZONA PUBLIC SERVICE COMPANY
2014–2023
TEN-YEAR TRANSMISSION SYSTEM PLAN

Prepared for the
Arizona Corporation Commission



January 2014

ARIZONA PUBLIC SERVICE COMPANY
2014 - 2023
TEN-YEAR TRANSMISSION SYSTEM PLAN

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ARIZONA PUBLIC SERVICE COMPANY
2014–2023
TEN-YEAR TRANSMISSION SYSTEM PLAN

GENERAL INFORMATION

Pursuant to A.R.S. § 40-360.02, Arizona Public Service Company ("APS") submits its 2014–2023 Ten-Year Transmission System Plan ("Ten-Year Plan"). Additionally, pursuant to Arizona Corporation Commission ("Commission") Decision No. 63876 (July 25, 2001) concerning the First Biennial Transmission Assessment ("BTA"), APS is including with this filing its Transmission Planning Process and Guidelines and maps showing system ratings on APS's transmission system. The Transmission Planning Process and Guidelines outline generally APS's internal planning for its high voltage and extra-high voltage ("EHV") transmission system, including a discussion of APS's planning methodology, planning assumptions, and its guidelines for system performance. The system ratings maps show continuous and emergency system ratings on APS's EHV system, and on its Metro, Northern, and Southern 230kV systems. APS also includes its Renewable Transmission Action Plan as an attachment to this filing. The Ten-Year Plan is conducted and filed annually with the Commission.

This Ten-Year Plan describes planned transmission lines of 115kV or higher voltage that APS may construct or participate in over the next ten-year period. Pursuant to A.R.S. § 40-360(10), underground facilities are not included. There are approximately 191 miles of 500kV transmission lines, 78 miles of 230kV transmission lines, 6 miles of 115kV transmission lines, and 7 bulk transformers contained in the projects in this Ten-Year Plan. The total investment for the APS projects and the anticipated APS portion of the participation projects as they are

modeled in this filing is estimated to be approximately $496 million.[1] The following table provides an overview of the projects included in this Ten-Year Plan.

Description	Projects in Ten-Year Plan
500kV transmission lines	191 miles
230kV transmission lines	78 miles
115kV transmission lines	6 miles
Bulk Transformers	7
Total Investment	$496 million[1]

Consistent with the Commission's Sixth BTA (Decision No. 72031, December 10, 2010) this Ten Year Plan includes information regarding planned transmission reconductor projects and substation transformer replacements. At this time, APS does not have any plans for reconductoring any existing transmission lines. These types of plans often change as they typically are in direct response to load growth or generator interconnections. Therefore, in-service dates for transformer replacement/additions and transmission reconductor projects change to reflect the load changes in the local system. Also, there may be projects added throughout the course of the planning year to accommodate new generator interconnections. The following table shows a list of the planned substation transformer replacements.

[1] The first three years of these additions are included in the Capital Expenditures table presented in the "Liquidity and Capital Resources" section of APS's 10-K filing, which also includes other transmission costs for new sub-transmission projects (69kV) and transmission upgrades and replacements. The Capital Expenditures table shows $607M for 2014 thru 2016.

Bulk Transformer Additions/Replacements

Description	Year
Buckeye 230/69kV Transformer #2 Replacement	2016
Raceway 230/69kV Transformer #2	2018
Palm Valley 230/69kV Transformer #2	2019
Yavapai 230/69kV Transformer #2	2021
Saguaro 230/69kV Transformer	2021

Some of the facilities reported in prior Ten-Year plan filings have been completed. Others have been canceled or deferred beyond the upcoming ten-year period and are not included in this Ten-Year Plan. The projects that have "To Be Determined" in-service dates are projects that have been identified, but are either still outside of the ten-year planning window or have in-service dates that have not yet been established. They have been included in this filing for informational purposes. A summary of changes from last year's Ten-Year plan is also provided. Additionally, a section is included that briefly describes projects still in the feasibility planning phase.

For convenience of the reader, APS has included system maps showing the electrical connections and in-service dates for all overhead transmission projects planned by APS for Arizona, the Phoenix Metropolitan Area, and the Yuma area. Written descriptions of each proposed transmission project are provided on subsequent pages in the currently expected chronological order of each project. The line routings shown on the system maps and the descriptions of each transmission line are intended to be general, showing electrical connections and not specific routings, and are subject to revision. Specific routing is recommended by the Arizona Power Plant and Transmission Line Siting Committee and ultimately approved by the Commission when issuing a Certificate of Environmental Compatibility and through subsequent

right-of-way acquisition. Pursuant to A.R.S. § 40-360.02(7), this filing also includes technical study results for the projects where construction dates have been identified. The technical study results show project needs that are generally based on either security (contingency performance), adequacy (generator interconnection or increasing transfer capability), or both.

APS participates in numerous regional planning organizations and in the WestConnect organization. Through membership and participation in these organizations, the needs of multiple entities, and the region as a whole, can be identified and studied, which maximizes the effectiveness and use of new projects. Regional organizations in which APS is a member include the Western Electricity Coordinating Council ("WECC"), the Southwest Area Transmission Planning ("SWAT"), and WestConnect. The plans included in this filing are the result of these coordinated planning efforts. APS provides an opportunity for other entities to participate in future planned projects.

Consistent with the Commission's Decision in the Seventh BTA, (Decision No. 73625, December 12, 2012), APS continues to monitor the reliability in Cochise County and, if applicable, will propose any appropriate modifications in future ten-year plans.

The Commission's Seventh BTA, suspended the requirements for performing RMR studies in every BTA and implemented criteria for restarting such studies. Since APS's last RMR study, there have been no triggering events that would require restarting a RMR study for Phoenix and Yuma load pockets, which are the two major areas in APS's service territory where load cannot be served totally by imports over transmission lines.

The Commission's Sixth BTA ordered that utilities include the effects of distributed generation and energy efficiency programs on future transmission needs. APS's modeled load, located in the Technical Study Report section of this filing, addresses these effects.

The projects identified in this Ten-Year Plan, with their associated in-service dates, will ensure that APS's transmission system meets all applicable reliability criteria. Changes in

regulatory requirements, regulatory approvals, or underlying assumptions such as load forecasts, generation or transmission expansions, economic issues, and other utilities' plans, may substantially impact this Ten-Year Plan and could result in changes to anticipated in-service dates or project scopes. Additionally, future federal and regional mandates may impact this Ten-Year Plan specifically and the transmission planning process in general. This Ten-Year Plan is tentative only and is subject to change without notice at the discretion of APS (A.R.S. § 40-360.02(F).

CHANGES FROM 2013-2022 TEN-YEAR PLAN

The following is a list of projects that were removed or changed from APS's January 2013 Ten-Year Plan filing, along with a brief description of why the change was made.

- The Youngs Canyon 345/69kV project is not included in the 2014-2023 Ten-Year Plan because the project has been placed into service.
- The Black Peak 161/69kV transformer replacement project is not included in the 2014-2023 Ten-Year Plan (bulk transformer additions section) because the project has been placed into service.
- The Saguaro (TS12) 230kV relocation and transformer addition project is not included in the 2014-2023 Ten-Year Plan because the scope of the project has changed. This project has changed to a transformer addition at Saguaro, and has been added to the Bulk Transformer Additions/Replacements table on page 2.
- APS filed an Application pursuant to A.R.S. § 40-252 with the Commission on October 18, 2012 for the North Valley 230kV Transmission Line Project (Case 120 Docket No. L-00000D-02-0120-0000). In its Application, APS requested a ten year extension of the term of the CEC to construct both the Scatter Wash (formerly Misty Willow) and Avery

substations, to cancel that portion of the CEC approving a double-circuit 230kV transmission line between the Westwing, Raceway and Pinnacle Peak substations, and to change the location of the Scatter Wash substation. On April 10, 2013 in Decision No. 73824, the Commission approved APS's Application. As a result, the only remaining facilities to be built are the Scatter Wash and Avery 230kV substations. The term to construct these facilities was extended ten years to June 18, 2023.

- The Raceway-Westwing 230kV line has been cancelled and removed from the 2014-2023 Ten-Year Plan due to the amended CEC application described above (Decision No. 73824, April 10, 2013).
- APS filed an Application pursuant to A.R.S. § 40-252 with the Commission on April 2, 2013 for the West Valley South Transmission Line Project (Case 122 Docket No. L-00000D-03-0122-00000). In its Application, APS requested a five year extension of the term of the CEC (to December 23, 2018) for the first circuit of the 230kV transmission line and for ten years (to December 23, 2028) for the second circuit and all remaining facilities. On June 27, 2013 in Decision No. 73937, the Commission approved APS's Application.
- The Palo Verde Hub – North Gila 500kV #2 Line is now referred to as Hassayampa – North Gila 500kV #2 Line to more accurately reflect the Point of Origin.

In-Service Date Changes

Project Name	**Previous In-Service Date**	**New In-Service Date**
Bagdad 115kV Line Relocation	2014	2017
North Gila – Orchard 230kV Line	2016	2018

The in-service dates shown in this table are based on factors such as load projections, scope changes, etc., not potential interconnections. New generation interconnections may accelerate the in-service date.

NEW PROJECTS IN THE 2014-2023 TEN-YEAR PLAN

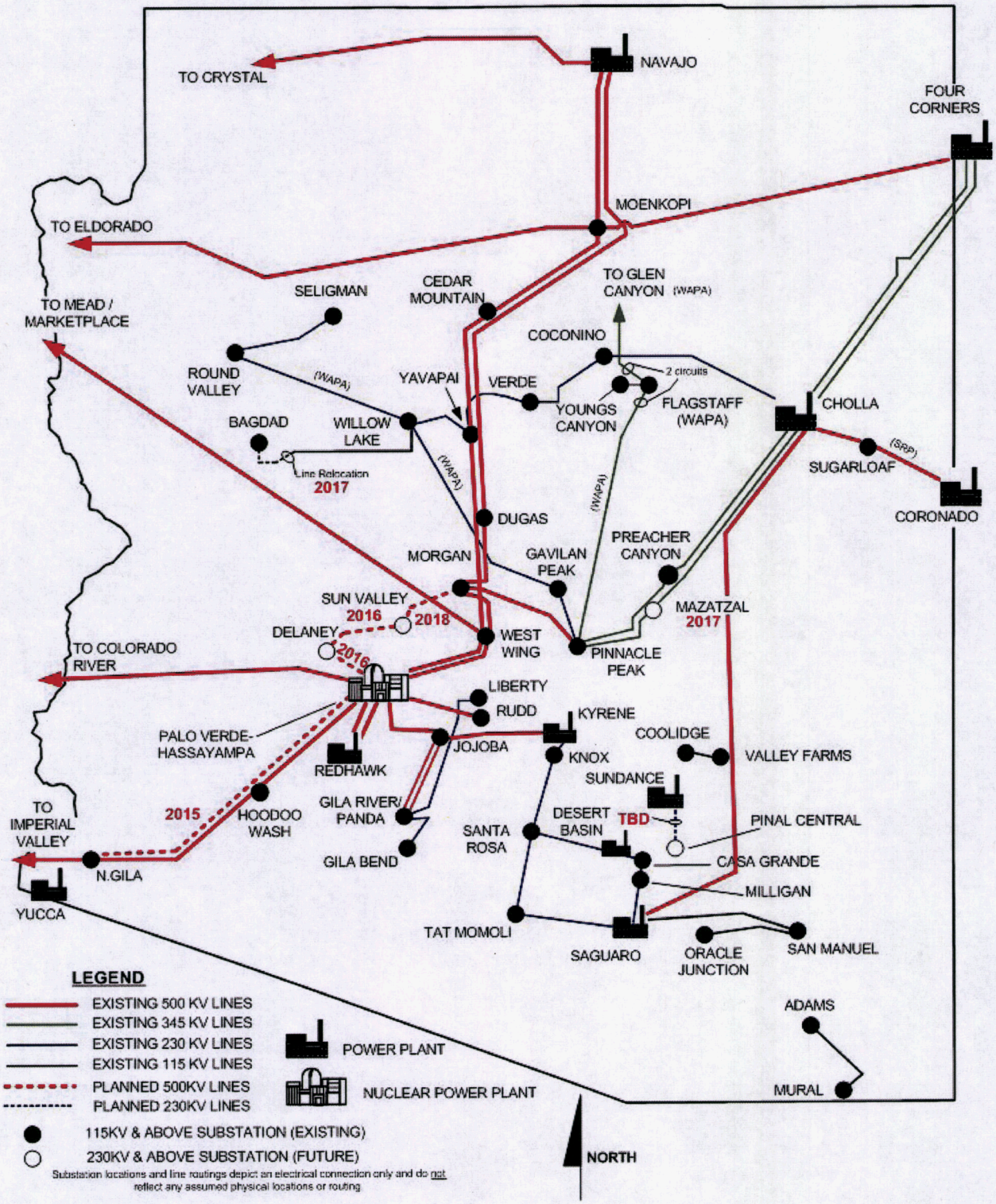
There are no new projects planned within the 2014-2023 Ten-Year Plan that were not in the 2013-2022 Ten-Year Plan.

CONCEPTUAL PROJECTS IN THE FEASIBILITY PLANNING PHASE

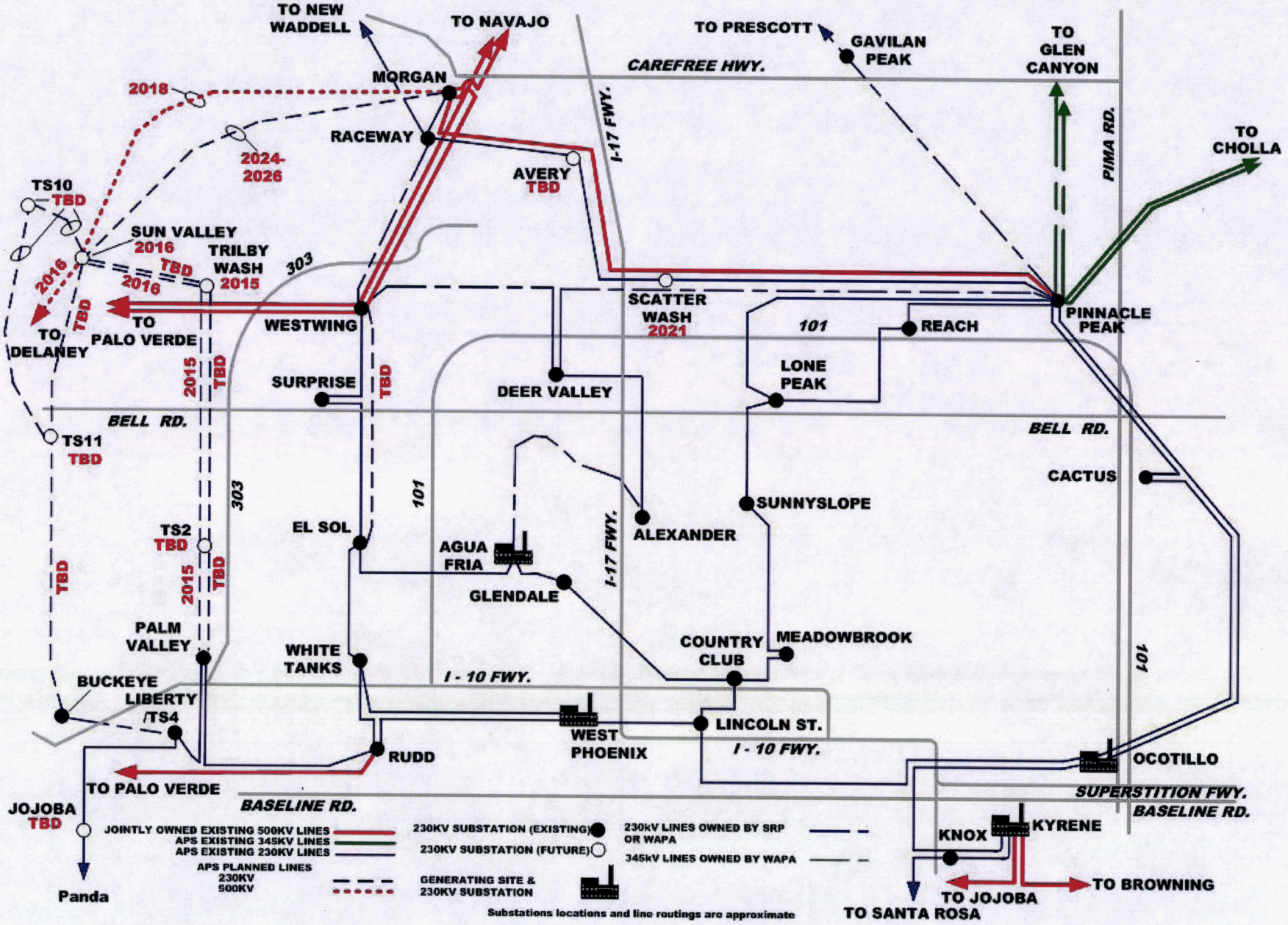
Palo Verde/Gila Bend Area To Valley Transmission Capacity

Additional transmission capacity will be studied from the Palo Verde/Gila Bend areas to the Phoenix load center. This transmission capacity is a robust component of the overall APS transmission and resource need. The areas around and west of Palo Verde as well as the Gila Bend area contain some of the best solar resources in the country. APS expects that at least a portion of the future solar resources specified in the APS Integrated Resource Plan (Docket No. E-00000A-11-0113) will be developed in relatively close proximity to these areas and will be supported by this transmission capacity. These areas also provide access to existing gas resources and, in the case of Palo Verde, potential new gas resources and market purchases.

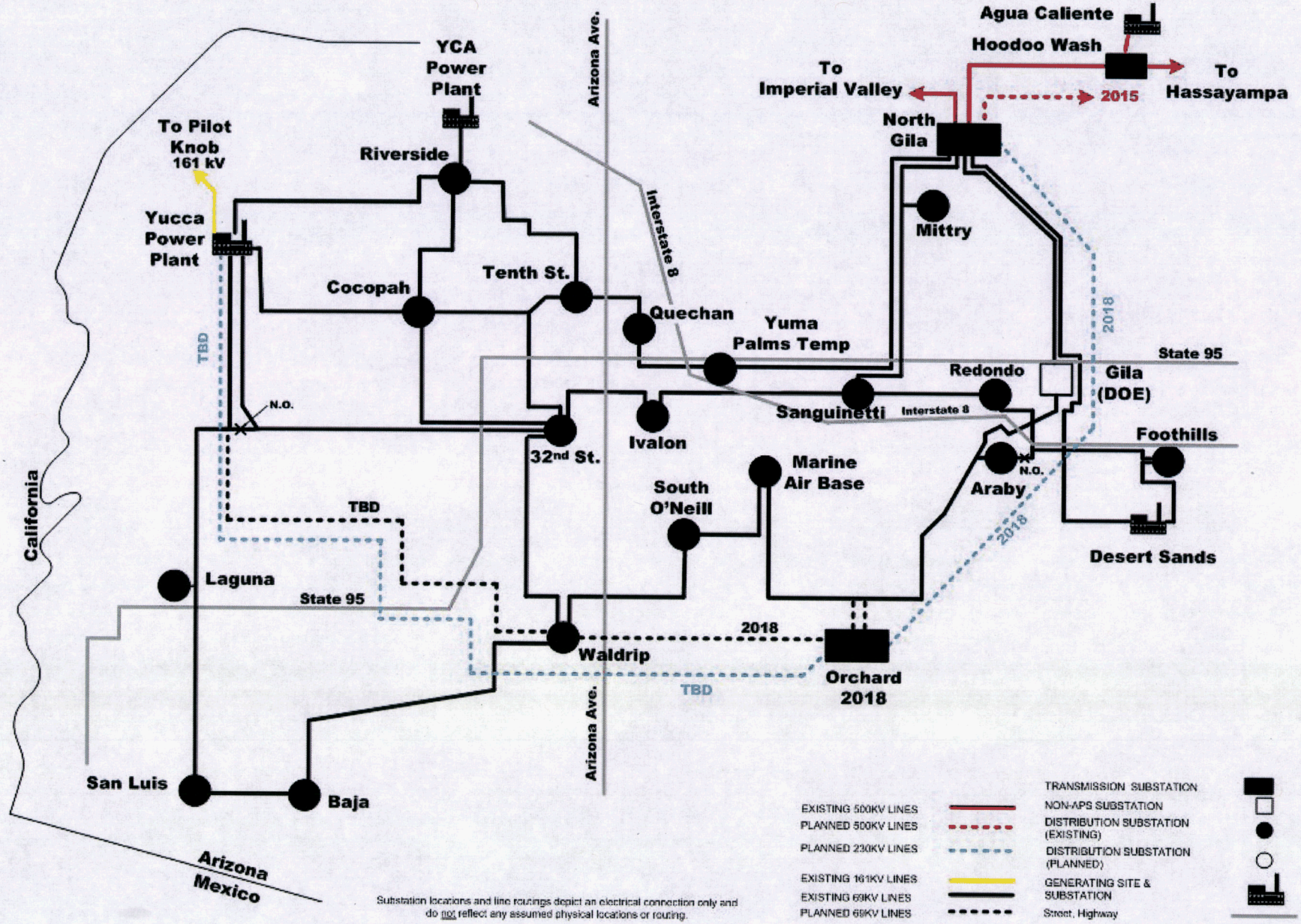
APS EHV & OUTER DIVISION 115/230 KV TRANSMISSION PLANS 2014 – 2023



PHOENIX METROPOLITAN AREA TRANSMISSION PLANS 2014-2023



Yuma Area Transmission Plans 2014-2023



Substation locations and line routings depict an electrical connection only and do not reflect any assumed physical locations or routing.

Arizona Public Service Company
2014 – 2023
Ten-Year Plan
Planned Transmission Description

2015

Line Designation	Hassayampa – North Gila 500kV #2 Line
Project Sponsor	Arizona Public Service Company
Other Participants	None
Size	
(a) Voltage Class	500kV AC
(b) Facility Rating	2200 A
(c) Point of Origin	Hassayampa switchyard
(d) Intermediate Points of Interconnection	
(e) Point of Termination	North Gila substation; Sec. 11, T8S, R22W
(f) Length	Approximately 110 miles
Routing	This line will generally follow the route of the existing Hassayampa-Hoodoo Wash-North Gila 500kV #1 line.
Purpose	This project will increase the import capability for the Yuma area and export/scheduling capability from the Palo Verde area to provide access to both solar and gas resources. This project will also allow the system to accommodate generation interconnection requests.
Date	
(a) Construction Start	2013
(b) Estimated In Service	2015
Permitting / Siting Status	*Certificate of Environmental Compatibility issued 1/23/08 (Case No. 135, Decision No. 70127, Palo Verde Hub to North Gila 500kV Transmission Line project). An amendment to the original CEC was granted on 12/3/13, Decision No. 74206, to relocate a 1,500 foot segment of the approved corridor east of the North Gila substation Construction activities began in mid-2013. Note – the Hassayampa line was previously referred to as the Palo Verde Hub to North Gila.*

Arizona Public Service Company
2014 – 2023
Ten-Year Plan
Planned Transmission Description

2015

Line Designation	Palm Valley – TS2 – Trilby Wash 230kV Line
Project Sponsor	Arizona Public Service Company
Other Participants	None
Size	
(a) Voltage Class	230kV AC
(b) Facility Rating	3000 A
(c) Point of Origin	Palm Valley substation; Sec. 24, T2N, R2W
(d) Intermediate Points of Interconnection	TS2 substation to be in-service by TBD; Sec. 25, T3N, R2W
(e) Point of Termination	Trilby Wash substation to be in-service by 2015; Sec. 20, T4N, R2W
(f) Length	Approximately 12 miles
Routing	North from the Palm Valley substation, generally following the Loop 303 to Cactus Road, west on Cactus Road to approximately 191st Avenue, and then north on 191st Avenue to the Trilby Wash substation.
Purpose	This project will serve the need for electric energy in the western Phoenix Metropolitan area and additional import capability into the greater Phoenix Metropolitan area. The proposed second 230kV source for Trilby Wash provides improved system reliability and continuity of service for communities in the area; such as El Mirage, Surprise, Youngtown, Goodyear, and Buckeye. The first circuit is scheduled to be in-service for the summer of 2015; the in-service date for the second circuit will be evaluated in future planning studies.
Date	
(a) Construction Start	2014
(b) Estimated In Service	2015
Permitting / Siting Status	*The Palm Valley-TS2 230kV line portion was sited as part of the West Valley South 230kV Transmission Line project and a Certificate of Environmental Compatibility was issued 12/22/03 (Case No. 122, Decision No. 66646). As described above, an amendment to the original CEC was granted on June 27, 2013, Decision No. 73937, to extend the term of the Certificate five years for the first circuit of the Project to December 23, 2018 and extend the term for the second circuit and other facilities ten years to December 23, 2018. The Trilby Wash-TS2 230kV line portion was sited as part of the West Valley North 230kV Transmission Line project and a Certificate of Environmental Compatibility was issued 5/5/05 (Case No. 127, Decision No. 67828).*

Arizona Public Service Company
2014 – 2023
Ten-Year Plan
Planned Transmission Description

2016[2]

Line Designation	Delaney – Palo Verde 500kV Line
Project Sponsor	Arizona Public Service Company
Other Participants	CAWCD
Size	
(a) Voltage Class	500kV AC
(b) Facility Rating	To be determined
(c) Point of Origin	Palo Verde Switchyard
(d) Intermediate Points of Interconnection	
(e) Point of Termination	Delaney Switchyard; Sec. 25, T2N, R8W
(f) Length	Approximately 15 miles
Routing	Generally leaving the Palo Verde Hub vicinity following the Palo Verde-Colorado River-Devers #1 and the Hassayampa-Harquahala 500kV lines to the Delaney Switchyard site in Sec. 25, T2N, R8W.
Purpose	This project is anticipated to interconnect generation projects at the Delaney switchyard. This line is also one section of a new 500kV path from Palo Verde around the western and northern edges of the Phoenix area and terminating at Pinnacle Peak. This is anticipated to be a joint participation project. APS will serve as the project manager.
Date	
(a) Construction Start	2011
(b) Estimated In Service	2016
Permitting / Siting Status	*Certificate of Environmental Compatibility issued 8/17/05 (Case No. 128, Decision No. 68063, Palo Verde Hub to TS5 500kV Transmission project). APS, as project manager, holds the CEC.*

[2] The previous in-service date of 2013 assumed there would be a resource developed at Delaney to utilize the project to effect a 2013 in-service date. Without such development to-date, the project is being listed with an in-service in 2016 with the Delaney-Sun Valley project per approval of the APS Renewable Transmission Action Plan in Decision No. 72057 (1/6/11), Docket No. E-01345A-10-0033.

Arizona Public Service Company
2014 – 2023
Ten-Year Plan
Planned Transmission Description

2016

Line Designation	Delaney – Sun Valley 500kV Line
Project Sponsor	Arizona Public Service Company
Other Participants	CAWCD
Size	
(a) Voltage Class	500kV AC
(b) Facility Rating	To be determined
(c) Point of Origin	Delaney Switchyard; Sec. 25, T2N, R8W
(d) Intermediate Points of Interconnection	
(e) Point of Termination	Sun Valley substation to be in-service by 2016; Sec. 29, T4N, R4W
(f) Length	Approximately 28 miles
Routing	Generally follows the Palo Verde-Colorado River-Devers #1 line until crossing the CAP canal. Then easterly, generally following the north side of the CAP canal to the new Sun Valley substation.
Purpose	This project will serve projected need for electric energy in the area immediately north and west of the Phoenix Metropolitan area. The project will increase the system reliability by providing a new transmission source to help serve the areas in the western portions of the Phoenix Metropolitan area. This is a joint participation project with APS as the project manager. It will also increase the import capability to the Phoenix Metropolitan area as well as increase the export/scheduling capability from the Palo Verde area to provide access to both solar and gas resources.
Date	
(a) Construction Start	2014
(b) Estimated In Service	2016
Permitting / Siting Status	*Certificate of Environmental Compatibility issued 8/17/05 (Case No. 128, Decision No. 68063, Palo Verde Hub to TS5 500kV Transmission project). APS, as project manager, holds the CEC.*

Arizona Public Service Company
2014 – 2023
Ten-Year Plan
Planned Transmission Description

2016

Line Designation	Sun Valley – Trilby Wash 230kV Line
Project Sponsor	Arizona Public Service Company
Other Participants	None
Size	
(a) Voltage Class	230kV AC
(b) Facility Rating	3000 A
(c) Point of Origin	Sun Valley substation to be in-service by 2016; Sec. 29, T4N, R4W
(d) Intermediate Points of Interconnection	
(e) Point of Termination	Trilby Wash substation to be in-service by 2015; Sec. 20, T4N, R2W
(f) Length	Approximately 15 miles
Routing	East from the Sun Valley substation along the CAP canal to approximately 243rd Ave., south to the existing 500kV transmission line corridor, and then east along the corridor to the Trilby Wash substation.
Purpose	This project is required to serve the need for electric energy in the western Phoenix Metropolitan area. Also, the project will provide more capability to import power into the Phoenix Metropolitan area along with improved reliability and continuity of service for communities in the area including El Mirage, Surprise, Youngtown, Buckeye, and unincorporated Maricopa county. The first circuit is scheduled to be in-service for the summer of 2016 and the in-service date for the second circuit will be evaluated in future planning studies.
Date	
(a) Construction Start	2014
(b) Estimated In Service	2016
Permitting / Siting Status	*Certificate of Environmental Compatibility issued 5/5/05 (Case No. 127, Decision No. 67828, West Valley North 230kV Transmission Line project).*

Arizona Public Service Company
2014 – 2023
Ten-Year Plan
Planned Transmission Description

2017

Line Designation	Bagdad 115kV Relocation Project
Project Sponsor	Arizona Public Service Company
Other Participants	None
Size	
(a) Voltage Class	115kV AC
(b) Facility Rating	430 A
(c) Point of Origin	Bagdad Capacitor switchyard; Sec. 10, T14N, R9W
(d) Intermediate Points of Interconnection	
(e) Point of Termination	Bagdad Mine substation; Sec. 31, T15N, R9W
(f) Length	Approximately 5.5 miles
Routing	Beginning at the existing APS capacitor switchyard and extending in a southwesterly direction for approximately 1.5 miles, then turning in a northwesterly direction approximately 4 miles to the existing Bagdad Mine substation. The project primarily crosses federal BLM lands, private lands (owned by the mine) and a short segment on Arizona State Trust Lands.
Purpose	Freeport McMoRan Inc. ("FMI") has future plans to expand the mine in the location of the existing 115kV transmission line. They requested that APS move the line in a southerly direction beyond the limits of the planned expansion.
Date	
(a) Construction Start	2016
(b) Estimated In Service	2017
Permitting / Siting Status	*Certificate of Environmental Compatibility issued on 7/16/09 (Case No. 143, Decision No. 71217, Bagdad 115kV Relocation Project). An amendment to the original CEC was granted on 11/21/12, Decision No. 73586, expanding a portion of the project corridor on FMI property to accommodate rerouting this line.*

Arizona Public Service Company
2014 – 2023
Ten-Year Plan
Planned Transmission Description

2017

Line Designation	Mazatzal 345/69kV Substation
Project Sponsor	Arizona Public Service Company
Other Participants	None
Size	
(a) Voltage Class	345kV AC
(b) Facility Rating	150 MVA
(c) Point of Origin	Cholla-Pinnacle Peak 345kV line; near Sec. 3, T8N, R10E
(d) Intermediate Points of Interconnection	
(e) Point of Termination	Mazatzal substation to be in-service by 2017; Sec. 3, T8N, R10E
(f) Length	Less than 1 mile
Routing	The Mazatzal 345/69kV substation will be constructed adjacent to the Cholla-Pinnacle Peak 345kV line corridor.
Purpose	This project is needed to provide the electric source and support to the sub-transmission system in the area of Payson and the surrounding communities. Additionally, improved reliability and continuity of service will result for the communities in the Payson area.
Date	
(a) Construction Start	2015
(b) Estimated In Service	2017
Permitting / Siting Status	*Certificate of Environmental Compatibility issued on 5/4/11 (Case No. 160, Decision No. 72302, Mazatzal Substation and 345kV Interconnection Project).*

Arizona Public Service Company
2014 – 2023
Ten-Year Plan
Planned Transmission Description

2018

Line Designation	North Gila – Orchard 230kV Line
Project Sponsor	Arizona Public Service Company
Other Participants	None
Size	
(a) Voltage Class	230kV AC
(b) Facility Rating	3000 A
(c) Point of Origin	North Gila substation; Sec. 11, T8S, R22W
(d) Intermediate Points of Interconnection	
(e) Point of Termination	Orchard 230kV substation to be in-service by 2018; Sec. 20, T9S, R22W
(f) Length	Approximately 13 miles
Routing	In general the line will proceed south from the North Gila substation until County 6 ½ Street, where it will head east for approximately 1 mile. Then following the existing Western Area Power Administration utility right-of-way south to County 9 ½ Street, where it will proceed east for approximately 0.3 mile before heading south on Avenue 10E. Then the route will proceed southwest adjacent to the Union Pacific Railroad and then adjacent to the A Canal until it turns south along the Yuma Area Service Highway alignment. The route then proceeds west along the County 13 ½ Street alignment to Avenue 5 ½E, where it will turn south to the Orchard termination point.
Purpose	This project serves the need for electric energy, improved reliability, and continuity of service for the greater Yuma area. This project is expected to be double circuit capable with one circuit in service in 2018 and the second circuit in service at a date to be determined.
Date	
(a) Construction Start	2016
(b) Estimated In Service	2018
Permitting / Siting Status	*Certificate of Environmental Compatibility issued 2/2/12 (Case No. 163, Decision No. 72801, North Gila to TS8 to Yucca 230kV Transmission Line project). Note – TS8 to Yucca 230KV Transmission Line is now referred to as North Gila – Orchard 230kV Line.*

Arizona Public Service Company
2014 – 2023
Ten-Year Plan
Planned Transmission Description

2018

Line Designation	Morgan – Sun Valley 500kV Line
Project Sponsor	Arizona Public Service Company
Other Participants	CAWCD
Size	
(a) Voltage Class	500kV AC
(b) Facility Rating	To be determined
(c) Point of Origin	Sun Valley substation to be in-service in 2016; Sec. 29, T4N, R4W
(d) Intermediate Points of Interconnection	
(e) Point of Termination	Morgan substation; Sec. 33, T6N, R1E
(f) Length	Approximately 38 miles
Routing	Generally the line will head north-northeast out of the Sun Valley substation and then east to the Morgan substation.
Purpose	This project will serve the electric energy needs in the northern Phoenix Metropolitan area. The project will also increase the reliability of the EHV system by completing a 500kV loop that connects the Palo Verde Transmission system, the Southern Navajo Transmission system, and the Southern Four Corners system. Additionally, the project will increase reliability by providing a second 500kV source for the Sun Valley substation and providing support for multiple Category C and D transmission contingencies. It will also increase the import capability to the Phoenix Metropolitan area, as well as increase the export/scheduling capability from the Palo Verde Hub area, which includes both solar and gas resources. This project is anticipated to be 500/230kV double-circuit capable.
Date	
(a) Construction Start	2015
(b) Estimated In Service	2018
Permitting / Siting Status	*Certificate of Environmental Compatibility issued on 3/17/09 (Case No. 138, Decision No. 70850, TS5-TS9 500/230kV Project). A Record of Decision was signed on January 16th, 2014 approving the issuance of a right-of-way for the portion of the Project on land managed by the Bureau of Land Management. A corresponding amendment to the Bradshaw-Harquahala Resource Management Plan was also approved.*

Arizona Public Service Company
2014 – 2023
Ten-Year Plan
Planned Transmission Description

2021

Line Designation	Scatter Wash 230/69kV Substation
Project Sponsor	Arizona Public Service Company
Other Participants	None
Size	
(a) Voltage Class	230kV AC
(b) Facility Rating	188 MVA
(c) Point of Origin	Pinnacle Peak-Raceway 230kV line; Sec. 8, T4N, R3E
(d) Intermediate Points of Interconnection	
(e) Point of Termination	Scatter Wash substation; Sec. 8, T4N, R3E
(f) Length	Less than 1 mile
Routing	The Scatter Wash substation will be located adjacent to the Pinnacle Peak-Raceway 230kV line.
Purpose	This project is needed to provide electric energy in the northern portions of the Phoenix Metropolitan area as well as increase the reliability and continuity of service for these areas.
Date	
(a) Construction Start	2020
(b) Estimated In Service	2021
Permitting / Siting Status	*Certificate of Environmental Compatibility issued on 6/18/03 (Case No. 120, Decision No. 65997, North Valley Project. The Scatter Wash Substation was referred to as TS6 in Case 120). As described above, APS filed an Application pursuant to A.R.S. § 40-252 to extend the term of this CEC and amend it to conform with subsequent decisions and circumstances. On April 10, 2013, inDecision No. 73824, the Commission approved APS's application to extend the term by 10 years to June 18, 2023 and to relocate the Scatter Wash substation to the north side of the approved corridor.*

Arizona Public Service Company
2014 – 2023
Ten-Year Plan
Planned Transmission Description

2024-2026

Line Designation	Morgan – Sun Valley 230kV Line
Project Sponsor	Arizona Public Service Company
Other Participants	None
Size	
(a) Voltage Class	230kV AC
(b) Facility Rating	To be determined
(c) Point of Origin	Sun Valley substation to be in-service by 2016; Sec. 29, T4N, R4W
(d) Intermediate Points of Interconnection	To be determined
(e) Point of Termination	Morgan substation; Sec. 33, T6N, R1E
(f) Length	Approximately 38 miles
Routing	This line will be co-located with the Morgan-Sun Valley 500kV line, which generally heads north-northeast out of the Sun Valley substation and then east to the Morgan substation.
Purpose	This project is needed to provide a transmission source to serve future load that emerges in the currently undeveloped areas south and west of Lake Pleasant. This line will be co-located with the Morgan-Sun Valley 500kV line.
Date	
(a) Construction Start	2024-2026
(b) Estimated In Service	2024-2026
Permitting / Siting Status	*Certificate of Environmental Compatibility issued on 3/17/09 (Case No. 138, Decision No. 70850, TS5-TS9 500/230kV Project). A Record of Decision was signed on January 16th, 2014 approving the issuance of a right-of-way for the portion of the Project on land managed by the Bureau of Land Management. A corresponding amendment to the Bradshaw-Harquahala Resource Management Plan was also approved.*

Arizona Public Service Company
2014 – 2023
Ten-Year Plan
Planned Transmission Description

To Be Determined

Line Designation	Avery 230/69kV Substation
Project Sponsor	Arizona Public Service Company
Other Participants	None
Size	
(a) Voltage Class	230kV AC
(b) Facility Rating	188 MVA
(c) Point of Origin	Pinnacle Peak-Raceway 230kV line; Sec. 8, T4N, R3E
(d) Intermediate Points of Interconnection	
(e) Point of Termination	Avery substation; Sec. 15, T5N, R2E
(f) Length	Less than 1 mile
Routing	The Avery substation will be constructed adjacent to the Pinnacle Peak-Raceway 230kV line at approximately the Dove Valley Rd. and 39th Ave. alignments.
Purpose	This project is needed to provide electric energy in the northern portions of the Phoenix Metropolitan area as well as increase the reliability and continuity of service for these areas. The need date for this substation is continuously evaluated as the load growth in the area is monitored.
Date	
(a) Construction Start	To be determined
(b) Estimated In Service	To be determined
Permitting / Siting Status	*Certificate of Environmental Compatibility issued on 6/18/03 (Case No. 120, Decision No. 65997, North Valley Project). As described above, APS filed an Application pursuant to A.R.S. § 40-252 to extend the term of this CEC and amend it to conform with subsequent decisions and circumstances. On April 10, 2013, Decision No. 73824, the Commission approved APS's application to extend the term by 10 years to June 18, 2023.*

Arizona Public Service Company
2014 – 2023
Ten-Year Plan
Planned Transmission Description

To Be Determined

Line Designation	Pinal Central – Sundance 230kV Line
Project Sponsor	Arizona Public Service Company
Other Participants	ED-2
Size	
(a) Voltage Class	230kV AC
(b) Facility Rating	3000 A
(c) Point of Origin	Sundance substation; Sec. 2, T6S, R7E
(d) Intermediate Points of Interconnection	
(e) Point of Termination	Pinal Central substation to be in-service by 2014; Sec. 30, T6S, R8E
(f) Length	Approximately 6 miles
Routing	The project will originate at a new substation on the Sundance property, proceeding west and then south along Curry Road to the half-section between State Route 287 and Earley Road. The final west to east alignment connecting into the Pinal Central Substation will be located within an ACC-approved corridor and is subject to further design and right-of-way acquisition analysis.
Purpose	This project will serve increasing loads in Pinal County, and throughout the APS system, and will improve reliability and continuity of service for the communities in the area. Also, the project will increase the reliability of Sundance by providing a transmission line in a separate corridor than the existing lines that exit the plant. The project will be constructed as a 230kV double-circuit capable line, but initially operated as a single-circuit. The in-service date for the second circuit will be evaluated in future planning studies.
Date	
(a) Construction Start	To be determined
(b) Estimated In Service	To be determined
Permitting / Siting Status	*Certificate of Environmental Compatibility issued 4/29/08 (Case No. 136, Decision No. 70325, Sundance to Pinal South 230kV Transmission Line project). Note – the Pinal South substation is now referred to as Pinal Central.*

Arizona Public Service Company
2014 – 2023
Ten-Year Plan
Planned Transmission Description

To Be Determined

Line Designation	Jojoba 230/69kV Substation
Project Sponsor	Arizona Public Service Company
Other Participants	None
Size	
(a) Voltage Class	230kV AC
(b) Facility Rating	188 MVA
(c) Point of Origin	Liberty (TS4)-Panda 230kV line; Sec. 25, T2S, R4W
(d) Intermediate Points of Interconnection	
(e) Point of Termination	Jojoba 230/69 substation with an in-service TBD; Sec. 25, T2S, R4W
(f) Length	Less than 1 mile
Routing	The Jojoba 230/69kV substation will be constructed adjacent to the Liberty (TS4)-Panda 230kV line.
Purpose	This project will provide the electrical source and support to the sub-transmission system to serve the need for electric energy for the communities including Buckeye, Goodyear, and Gila Bend. The project will also increase the reliability and continuity of service for those areas.
Date	
(a) Construction Start	To be determined
(b) Estimated In Service	To be determined
Permitting / Siting Status	*Certificate of Environmental Compatibility issued 10/16/00 (Case No. 102, Decision No. 62960, Gila River Transmission Project) for the Gila River Transmission Project which included the interconnection of the 230kV substation.*

Arizona Public Service Company
2014 – 2023
Ten-Year Plan
Planned Transmission Description

To Be Determined

Line Designation	Orchard – Yucca 230kV Line
Project Sponsor	Arizona Public Service Company
Other Participants	None
Size	
(a) Voltage Class	230kV AC
(b) Facility Rating	To be determined
(c) Point of Origin	Yucca substation; Sec. 36, T7S, R24W
(d) Intermediate Points of Interconnection	
(e) Point of Termination	Orchard 230kV substation to be in-service by 2018; Sec. 20, T9S, R22W
(f) Length	Approximately 19 miles
Routing	The line will proceed west from the Orchard substation along County 14th Street to the A Canal. Then the route will proceed southwest along the A Canal to Avenue 4E, where it will continue west along County 14 ½ Street to US 95. The line will proceed north along US 95 to the County 13 ½ Street alignment and proceed west along County 13 ½ and County 13th Street. At Avenue F the line will proceed north to Levee Road, where it will proceed north east until the 8th Street alignment. The line will proceed east along 8th Street until Calle Agua Salada Road, where it will proceed north to the Yucca Power Plant.
Purpose	This double circuit 230kV project will serve the need for electric energy, improve reliability, and continuity of service for the greater Yuma area. Additionally, this project will provide a second electrical source to the future Orchard substation. The ability to transmit electric energy generated by renewable resources in the region may be an additional benefit subject to study by APS in regional planning forums.
Date	
(a) Construction Start	To be determined
(b) Estimated In Service	To be determined
Permitting / Siting Status	*Certificate of Environmental Compatibility issued 2/2/12 (Case No. 163, Decision No. 72801, North Gila to TS8 to Yucca 230kV Transmission Line project). Note – TS8 to Yucca 230 kV Line is now referred to as Orchard – Yucca 230 KV Line.*

Arizona Public Service Company
2014 – 2023
Ten-Year Plan
Planned Transmission Description

To Be Determined

Line Designation	Sun Valley – TS10 –TS11 230kV Line
Project Sponsor	Arizona Public Service Company
Other Participants	None
Size	
(a) Voltage Class	230kV AC
(b) Facility Rating	To be determined
(c) Point of Origin	Sun Valley substation to be in-service by 2016; Sec. 29, T4N, R4W
(d) Intermediate Points of Interconnection	A future TS10 substation; location to be determined
(e) Point of Termination	A future TS11 substation; location to be determined
(f) Length	To be determined
Routing	The routing for this line has not yet been determined.
Purpose	This project is needed to provide a transmission source to serve future load that emerges in the currently undeveloped areas northwest of the White Tank Mountains. This line is anticipated to be a 230kV line originating from the Sun Valley substation, with the future TS10 230/69kV substation to be interconnected into the 230kV line.
Date	
(a) Construction Start	To be determined
(b) Estimated In Service	To be determined
Permitting / Siting Status	*An application for a Certificate of Environmental Compatibility has not yet been filed.*

Arizona Public Service Company
2014 – 2023
Ten-Year Plan
Planned Transmission Description

To Be Determined

Line Designation	Buckeye – TS11 – Sun Valley 230kV Line
Project Sponsor	Arizona Public Service Company
Other Participants	None
Size	
(a) Voltage Class	230kV AC
(b) Facility Rating	To be determined
(c) Point of Origin	Sun Valley substation to be in-service by 2016; Sec. 29, T4N, R4W
(d) Intermediate Points of Interconnection	A future TS11 substation; location to be determined
(e) Point of Termination	Buckeye substation; Sec. 7, T1N, R3W
(f) Length	To be determined
Routing	The routing for this line has not yet been determined.
Purpose	This project will serve the need for electric energy in the largely undeveloped areas west of the White Tank Mountains. This project will provide the first portion of the transmission infrastructure in this largely undeveloped area and will provide a transmission connection between the northern and southern transmission sources that will serve the area. Improved reliability and continuity of service will result for this portion of Maricopa County. It is anticipated that this project will be constructed with double-circuit capability, but initially operated as a single circuit. The in-service date and location of the TS11 230/69kV substation will be determined in future planning studies based upon the development of the area.
Date	
(a) Construction Start	To be determined
(b) Estimated In Service	To be determined
Permitting / Siting Status	*An application for a Certificate of Environmental Compatibility has not yet been filed.*

Arizona Public Service Company
2014 – 2023
Ten-Year Plan
Planned Transmission Description

To Be Determined

Line Designation	El Sol – Westwing 230kV Line
Project Sponsor	Arizona Public Service Company
Other Participants	None
Size	
(a) Voltage Class	230kV AC
(b) Facility Rating	To be determined
(c) Point of Origin	Westwing substation; Sec. 12, T4N, R1W
(d) Intermediate Points of Interconnection	
(e) Point of Termination	El Sol substation; Sec. 30, T3N, R1E
(f) Length	Approximately 11 miles
Routing	Generally following the existing Westwing-Surprise-El Sol 230kV corridor.
Purpose	This project will increase system capacity to serve the Phoenix Metropolitan area, while maintaining system reliability and integrity for delivery of bulk power from Westwing south into the APS Phoenix Metropolitan area 230kV transmission system.
Date	
(a) Construction Start	To be determined
(b) Estimated In Service	To be determined
Permitting / Siting Status	*Certificate of Environmental Compatibility issued 7/26/73 (Case No. 9, Docket No. U-1345). Note that this Certificate authorizes two double-circuit lines. Construction of the first double-circuit line was completed in March 1975. Construction of the second line, planned to be built with double-circuit capability, but initially operated with a single circuit, is described above.*

Arizona Public Service Company
2014 – 2023
Ten-Year Plan
Planned Transmission Description

To Be Determined

Line Designation	Palo Verde – Saguaro 500kV Line
Project Sponsor	CATS Sub-Regional Planning Group Participants
Other Participants	To be determined
Size	
(a) Voltage Class	500kV AC
(b) Facility Rating	To be determined
(c) Point of Origin	Palo Verde switchyard; Sec. 34, T1N, R6W
(d) Intermediate Points of Interconnection	
(e) Point of Termination	Saguaro substation; Sec. 14, T10S, R10E
(f) Length	Approximately 130 miles
Routing	Generally south and east from the Palo Verde area to a point near Gillespie Dam, then generally easterly until the point at which the Palo Verde-Kyrene 500kV line diverges to the north and east. The corridor then continues generally south and east again, adjacent to a gas line corridor, until converging with the Tucson Electric Power Company's Westwing-Pinal West-South 345kV line. The corridor follows the 345kV line until a point due west of the Saguaro Generating Station. The corridor then follows a lower voltage line into the 500kV yard just south and east of the Saguaro Generating Station.
Purpose	The line will increase the adequacy of the existing EHV transmission system and increase power delivery throughout the state.
Date	
(a) Construction Start	To be determined
(b) Estimated In Service	To be determined
Permitting / Siting Status	*Certificate of Environmental Compatibility issued 1/23/76 (Case No. 24, Decision No. 46802).*

A subsidiary of Pinnacle West Capital Corporation

TRANSMISSION PLANNING PROCESS AND GUIDELINES

APS Transmission Planning
January 2014

Table of Contents

I. INTRODUCTION AND PURPOSE

The Transmission Planning Process and Guidelines (Guidelines) are used by Arizona Public Service Company (APS) to assist in planning its Extra High Voltage (EHV) transmission system (345 kV and 500 kV) and High Voltage transmission system (230 kV and 115 kV). In addition to these Guidelines, APS follows the Western Electricity Coordinating Council's (WECC) System Performance Criteria (TPL-001-WECC-CRT-02) in addition to NERC Table 1.

II. PLANNING METHODOLOGY

A. General

APS uses a deterministic approach for transmission system planning. Under this approach, system performance should meet certain specific criteria under normal conditions (all lines in-service), for any single contingency condition and for selected double contingency conditions as defined under TPL-001-WECC-CRT-02. In general, an adequately planned transmission system will:

- Provide an acceptable level of service that is cost-effective for normal, single and selected double contingency conditions.
- Maintain service to all firm loads for any single or selected double contingency outages; except for radial loads.
- Not result in overloaded equipment or unacceptable voltage conditions for single or selected double contingency outages.
- Not result in cascading for single or selected double contingency outages.
- Provide for the proper balance between the transmission import capability and local generation requirements for an import limited load area.

Although APS uses a deterministic approach for transmission system planning, the WECC reliability planning criteria provides for exceptions based on methodologies provided by the WECC RPEWG. Historical system reliability performance is analyzed on a periodic basis and the results are used in the design of planned facilities.

These planning methodologies, assumptions, and guidelines are used as the basis for the development of future transmission facilities. Additionally,

consideration of potential alternatives to transmission facilities (such as distributed generation or new technologies) is evaluated on a case-specific basis.

As new planning tools and/or information become available revisions or additions to these guidelines will be made as appropriate.

B. Transmission Planning Process

APS' transmission planning process consists of an assessment of the following needs:

- Provide adequate transmission to access designated network resources in-order to reliably and economically serve all network loads.
- Support APS' and other network customers' local transmission and sub-transmission systems.
- Provide for interconnection to new resources.
- Accommodate requests for long-term transmission access.

During this process, consideration is given to load growth patterns, other system changes affected by right-of-way, facilities siting constraints, routing of future transportation corridors, and joint planning with neighboring utilities, governmental entities, and other interested stakeholders (see APS OATT Attachment (E)).

1. EHV Transmission Planning Process

APS' EHV transmission system, which consists of 500 kV and 345 kV, has primarily been developed to provide transmission to bring the output of large base-loaded generators to load centers, such as Phoenix. Need for new EHV facilities may results from any of the bullet items described above. APS' annual planning process includes an assessment of APS' transmission capability to ensure that designated network resources can be accessed to reliably and economically serve all network loads. In addition, Reliability Must-Run (RMR) studies are selectively performed to ensure that proper balance between the transmission import capability and local generation requirements for an import limited load area are maintained.

2. 230 kV Transmission Planning Process

APS' 230 kV transmission system has primarily been developed to provide transmission to distribute power from the EHV bulk power substations and local generators to the distribution system and loads throughout the load areas.

Planning for the 230 kV system assesses the need for new 230/69 kV substations to support local sub-transmission and distribution system growth and the reliability performance of the existing 230 kV system. This process takes into account the future land use plans that were developed by government agencies, Landis aerial photo maps, master plans that were provided by private developers, and APS' long-range forecasted load densities per square mile for residential, commercial, and industrial loads.

3. Transmission Facilities Required for Generation/Resource Additions

New transmission facilities may also be required in conjunction with generation resources due to (1) a "merchant" request by an Independent Power Producer (IPP) for generator interconnection to the APS system, (2) a "merchant" request for point-to-point transmission service from the generator (receipt point) to the designated delivery point, or (3) designation of new resources or re-designation of existing units to serve APS network load (including removal of an older units' native load designation). These studies/processes are performed pursuant to the APS Open Access Transmission Tariff (OATT).

C. Ten Year Transmission System Plans

Each year APS uses the planning process described in section B to update the Ten Year Transmission System Plan. The APS Ten Year Transmission System Plan identifies all new transmission facilities, 115 kV and above, and all facility replacements/upgrades required over the next ten years to reliably and economically serve the load.

D. Regional Coordinated Planning

1. Western Electricity Coordinating Council (WECC)

APS is a member of the WECC. The focus of the WECC is promoting the reliability of the interconnected bulk electric system. The WECC provides the means for:

- Developing regional planning and operating criteria.
- Coordinating future plans.
- Establishing new or modifying existing WECC Path Ratings through procedures.
- Compiling regional data banks, including the BCCS, for use by the member systems and the WECC in conducting technical studies.
- Assessing and coordinating operating procedures and solutions to regional problems.
- Establishing an open forum with interested non-project participants to review the plan of service for a project.
- Through the WECC Transmission Expansion Policy Committee, performing economic transmission congestion analysis.

APS works with WECC to adhere to these planning practices.

2. Technical Task Force and ad-hoc Work Groups

Many joint participant projects in the Desert Southwest rely on technical study groups for evaluating issues associated with their respective projects. These evaluations often include studies to address various types of issues associated with transfer capability, interconnections, reliability and security. APS actively participates in many of these groups such as the Western Arizona Transmission System Task Force, Four Corners Technical Task Force and the Eastern Arizona Transmission System Task Force.

3. Sub-Regional Planning Groups

Southwest Area Transmission Planning (SWAT) and other sub-regional planning groups provide a forum for entities within a region, and any other interested parties, to determine and study the needs of the region as a whole. It also provides a forum for specific projects to be exposed to potential partners and allows for joint studies and participation from interested parties.

4. WestConnect

APS and the other WestConnect members executed the WestConnect Project Agreement for Subregional Transmission Planning in May of 2007. This agreement promotes coordination of regional transmission planning for the WestConnect planning area by formalizing a relationship among the WestConnect members and the WestConnect area sub-regional planning groups including SWAT. The agreement provides for resources and funding for the development of a ten year integrated regional transmission plan for the WestConnect planning area. The agreement also ensures that the WestConnect transmission planning process will be coordinated and integrated with other planning processes within the Western Interconnection and with the WECC planning process.

5. Joint Studies

In many instances, transmission projects can serve the needs of several utilities and/or IPPs. To this end, joint study efforts may be undertaken. Such joint study efforts endeavor to develop a plan that will meet the needs and desires of all individual companies involved.

E. Generation Schedules

For planning purposes, economic dispatches of network resources are determined for APS' system peak load in the following manner:

- Determine base generation available and schedule these units at maximum output.
- Determine resources purchased from other utilities, IPPs, or power marketing agencies.
- Determine APS' spinning reserve requirements.
- Schedule intermediate generation (oil/gas steam units) such that the spinning reserve requirements, in section (c) above, are met.
- Determine the amount of peaking generation (combustion turbine units) required to supply the remaining system peak load.

Phoenix area network resources are dispatched based on economics and any existing import limitations. When possible, spinning reserve will be carried on higher cost Phoenix area network generating units.

Generation output schedules for interconnected utilities and IPPs are based upon consultation with the neighboring utilities and IPPs or as modeled in the latest data in WECC coordinated study cases.

F. Load Projections

APS substation load projections are based on the APS Corporate Load Forecast. Substation load projections for neighboring interconnected utilities or power agencies operating in the WECC area are based on the latest data in WECC coordinated study cases. Heavy summer loads are used for the Ten Year Transmission System Plans.

G. Alternative Evaluations

1. General

In evaluating several alternative plans, comparisons of power flows, transient stability tests, and fault levels are made first. After the alternatives are found that meet the system performance criteria in each of these three areas comparisons may be made of the losses, transfer capability, impact on system operations, and reliability of each of the plans. Finally, the costs of facility additions (capital cost items), costs of losses, and relative costs of transfer capabilities are determined. A brief discussion of each of these considerations follows.

2. Power Flow Analyses

Power flows of base case (all lines in-service) and single contingency conditions are tested and should conform to the system performance criteria set forth in Section IV of these Guidelines. Double or multiple contingencies are also examined in the context of common mode and common corridor outages. Normal system voltages, voltage deviations, and voltage extreme limitations are based upon operating experience resulting in acceptable voltage levels to the customer.

Power flow limits are based upon the thermal ratings and/or sag limitations of conductors or equipment, as applicable.

3. Transient Stability Studies

Stability guidelines are established to maintain system stability for single contingency, three-phase fault conditions. Double or multiple contingencies are also examined in the context of common mode and common corridor outages.

4. Short Circuit Studies

Three-phase and single-phase-to-ground fault studies are performed to ensure the adequacy of system protection equipment to clear and isolate faults.

5. Reactive Power Margin Analyses

Reactive Power Margin analyses are performed when steady-state analyses indicate possible insufficient voltage stability margins. V-Q curve analyses are used to determine post-transient voltage stability.

6. Losses Analyses

A comparison of individual element and overall transmission system losses are made for each alternative plan being studied. The losses computed in the power flow program consist of the I^2R losses of lines and transformers and the core losses in transformers, where represented.

7. Transfer Capability Studies

In evaluating the relative merits of one or more EHV transmission plans, non-simultaneous ratings are determined using methodologies consistent with WECC Path Rating Procedures as defined in the *WECC Project Coordination and Path Rating Processes* manual and NERC Standard MOD-029-1. In addition, simultaneous relationships are identified that can either be mitigated through use of nomograms, operating procedures or other methods.

8. Subsynchronous Resonance (SSR)

SSR phenomenon result from the use of series capacitors in the network where the tuned electrical network exchanges energy with a turbine generator at one or more of the natural frequencies of the mechanical system. SSR countermeasures are applied to prevent damage to machines as a result of transient current or sustained oscillations following a system disturbance. SSR

studies are not used directly in the planning process. SSR countermeasures are determined after the transmission plans are finalized.

9. FACTS (Flexible AC Transmission System

FACTS devices are a recent application of Power Electronics to the transmission system. These devices make it possible to use circuit reactance, voltage magnitude and phase angle as control parameters to redistribute power flows and regulate bus voltages, thereby improving power system operation.

FACTS devices can provide series or shunt compensation. These devices can be used as a controllable voltage source in series or as a controllable current source in shunt mode to improve the power transmission system operations.

FACTS will be evaluated as a means of power flow control and/or to provide damping to dynamic oscillations where a need is identified and it is economically justified. Examples include DSTATCOM for power factor correction and the DVR for dynamic voltage regulation for distribution loads.

10. Economic Evaluation

In general, an economic evaluation of alternative plans consists of a cumulative net present worth or equivalent annual cost comparison of capital costs.

III. PLANNING ASSUMPTIONS

A. <u>General</u>

1. Loads

Loads used for the APS system originate from the latest APS Corporate Load Forecast. In most cases, the corrected power factor of APS loads is 99.5% at 69 kV substations.

2. Generation and Other Resources

Generation dispatch is based on firm power and/or transmission wheeling contracts including network resources designations.

3. Normal Voltage Levels

Nominal EHV design voltages are 500 kV, 345 kV, 230 kV, and 115 kV. Nominal EHV operating voltages are 535 kV, 348 kV, 239 kV, and 119 kV, with exceptions to certain buses.

4. Sources of Databases

APS currently relies on WECC cases and internal data listings as their depository of EHV and HV system data and models. WECC has chosen to pursue a relational database (i.e. Base Case Coordination System) to maintain data and models for its members in addition to using WECC base cases. APS will begin to use the BCCS as the system becomes available.

5. Voltage Control Devices

Devices which can control voltages are shunt capacitors, shunt reactors, tap-changing-under-load (TCUL) and fixed-tap transformers, static Volt Ampere Reactive (VAR) compensators, and machine VAR capabilities. If future voltage control devices are necessary, these devices will be evaluated based upon economics and the equipment's ability to obtain an adequate voltage profile on the EHV and HV systems. Currently, APS has TCULs on only its 500 kV autotransformers except for a few transformers. Other than operator control, the TCUL transformers do not automatically regulate voltages.

6. Phase Shifters

For pre-disturbances scenarios, phase shifters may be used to hold flows depending on the objectives of the study. For post-disturbance scenarios, the phase shifters are assumed to not hold flows and are not automatically regulated.

7. Conductor Sizes

APS uses several types of standard phase conductors depending on the design, voltage class and application for new transmission lines. Table 1 lists the current standard conductor sizes for the various voltage levels used for new facilities.

Table 1. Standard conductor sizes.

Class	Conductor
525 kV	3x1780 kcm ACSR Chukar 2x2156 kcm ACSR Bluebird
345 kV	2x795 kcm ACSR Tern
230 kV	1x2156 kcm ACSS Bluebird 1x1272 kcm ACSR Bittern

	1x795 kcm ACSR Tern
115 kV	(same as 230 kV construction)
69 kV	1x795 kcm ACSS Tern 1x795 kcm AA Arbutus 1x336 kcm ACSR Linnet

8. 69 kV System Modeling

230 kV facility outages may impact the underlying 69 kV system due to the interconnection of those systems. For this reason, power flow cases may include a detailed 69 kV system representation. Solutions to any problems encountered on the 69 kV system are coordinated with the subtransmission planning engineers.

9. Substation Transformers

- 500 kV and 345 kV Substations

Bulk substation transformer banks may be made up of one three-phase or three single-phase transformers, depending upon bank size and economics. For larger banks where single-phase transformers are used, a fourth (spare) single-phase transformer will be used in a jack-bus arrangement to improve reliability and facilitate connection of the spare in the event of an outage of one of the single-phase transformers.

TCULs are typically used on the 525 kV transformers generally with a range of plus or minus 10% of nominal voltage. Primary voltages will be 525 kV or 345 kV, and secondary voltages will be 230 kV or 69 kV and tertiary voltages will be 34.5 kV, 14.4 kV or 12.47 kV.

- 230 kV Substations

For high-density load areas, both 230/69 kV and 69/12.5 kV transformers can be utilized. 230/69kV transformers will be rated at 113/150/188 MVA with a 65°C temperature rise, unless otherwise specified. 69/12.5kV transformers will be rated at 25/33/41 MVA with a 65°C temperature rise, unless otherwise specified.

With all elements in service, a transformer may be loaded up to its top Forced Air (ONAF) rating without sustaining any loss of service life. For a single contingency outage (loss of one transformer) the remaining new

transformer or transformers may be loaded up to 25% above their top ONAF rating, unless heat test data indicate a different overload capability. The loss of service life sustained will depend on the transformer pre-loading and the outage duration. No-load tap setting adjustment capabilities on 230/69 kV transformers will be ±5% from the nominal voltage setting (230/69 kV) at 2½% increments.

10. Switchyard Arrangements

- 500 kV and 345 kV Substations

Existing 345 kV switchyard arrangements use breaker-and-one-half, main-and-transfer, or modified paired-element circuit breaker switching schemes. Because of the large amounts of power transferred via 500 kV switchyards and the necessity of having adequate reliability, all 500 kV circuit breaker arrangements are planned for an ultimate breaker-and-one-half scheme. If only three or four elements are initially required, the circuit breakers are connected in a ring bus arrangement, but physically positioned for a breaker-and-one-half scheme. The maximum desired number of elements to be connected in the ring bus arrangement is four. System elements such as generators, transformers, and lines will be arranged in breaker-and-one-half schemes such that a failure of a center breaker will not result in the loss of two lines routed in the same general direction and will minimize the impact of losing two elements.

- 230 kV Substations

Future 230/69 kV substations should be capable of serving up to 452 Megavolt-Amps (MVA) of load. 400 MVA has historically been the most common substation load level in the Phoenix Metropolitan area. Future, typical 230/69 kV substations should accommodate up to four 230 kV line terminations and up to three 230/69 kV transformer bays. Based upon costs, as well as reliability and operating flexibility considerations, a breaker-and-one-half layout should be utilized for all future 230/69 kV Metropolitan Phoenix Area substations, with provision for initial development to be a ring bus. Any two 230/69 kV transformers are to be separated by two breakers,

whenever feasible, so that a stuck breaker will not result in an outage of both transformers.

11. Series Capacitor Application

Series capacitors are planned according to the needs of their associated transmission projects and are typically a customized design. Benefits resulting from the installation of series capacitors include but are not limited to improved transient stability, voltage regulating capability and reactive capability. A new series capacitor installation will currently include MOV protection that mitigates fault current levels through the series capacitor for internal faults. A bank will typically bypass for internal faults because there is no benefit to requiring that the bank remain in service when the line is tripped. Depending on the required impedances and ampacity level, new series capacitor banks may be either one to three segment units. The bank ratings should be based upon line's ultimate uses. At a minimum bank should be upgradable to higher ampacity needs in the future. Most 500 kV banks in APS system have a continuous rating of either 1750 A or 2200 A. ANSI standard require that the 30 minutes emergency rating be 135% of the continuous.

12. Shunt and Tertiary Reactor Application

Shunt and/or tertiary reactors may be installed to prevent open end line voltages from being excessive, in addition to voltage control. The open end line voltage must not be more than 0.05 per unit voltage greater than the sending end voltage. Tertiary reactors may also be used for voltage and VAR control as discussed above. EHV reactors are used to adjust pre-disturbance voltages if controlled through a breaker, circuit switcher or motor operated disconnect switch. APS currently does not automatically control its EHV or HV reactors or capacitors.

B. Power Flow Studies

1. System Stressing

Realistic generation capabilities and schedules should be used to stress the transmission system in order to maximize the transfer of resources during the

maximum load condition or path rating studies. Existing WECC or regional path ratings and facilities ratings will not be violated pre- or facility ratings post-disturbance.

2. Displacement

In cases where displacements (due to power flow opposite normal generation schedules) may have an appreciable effect on transmission line loading, a reasonable amount of displacement (Generation Units) may be removed in-order to stress a given transmission path. Alternately, no fictitious generation sources may be used to stress paths.

C. Transient Stability Studies

1. Fault Simulation

When studying system disturbances caused by faults, two conditions will be simulated:

- Three-phase-to-ground faults with normal clearing.
- Single-line-to-ground faults with a stuck circuit breaker in one phase with delayed clearing.

2. Margin

- Generation margin may be applied for the contingencies primarily affected by generation.
- Power flow margin may be applied for the contingencies primarily affected by power flow

3. Unit Tripping

Generator unit tripping may be allowed in-order to increase system stability performance if part of a proposed or existing remedial action scheme.

4. Machine Reactance Representation

For transient stability studies, the unsaturated transient reactance of machines with full representation will be used.

5. Fault Damping

Fault damping will be applied to the generating units adjacent to faults. Fault damping levels will be determined from studies that account for the effect of

generator amortisseur windings and the SSR filters. Fault damping will be applied on the buses listed in Table 2 for faults on the nearest EHV or HV bus.

Table 2. Fault damping levels.

Fault location	Affected units	Percent Damping
Palo Verde 500 kV	1-3	7.25%
Four Corners 500 & 345 kV	4&5	10%
Coronado 500 kV	1&2	12.5%
Cholla 500 kV	2-4	10%

6. Series Capacitor Switching

For APS designed banks, a MOV/by-pass model is employed in transient stability analysis.

D. Short Circuit Studies

Three-phase and single-phase-to-ground faults will be evaluated.

1. Generation Representation

All generation will be represented.

2. Machine Reactance Representation

The saturated subtransient reactance (X''_d) values will be used.

3. Line Representation

Unless previously calculated as part of APSs requirement for MOD-032, the transmission line zero sequence impedance (Z_0) is assumed to be equal to three times the positive sequence impedance (Z_1). If a new transmission impedance is required, APS utilizes the CAPE line constant program for determining sequence values.

4. Transformer Representation

The transformer zero sequence impedance (X_0) is assumed to be equal to the positive sequence impedance (X_1). Bulk substation transformers are modeled as auto-transformers. The two-winding model is that of a grounded-wye transformer. The three-winding model is that of a wye-delta-wye with a solid ground.

5. Series Capacitor Switching

Series capacitors, locations to be determined from short circuit studies, will be flashed and reinserted as appropriate.

E. Reactive Power Margin Studies

Using Q-V curve analyses, APS assesses the interconnected transmission system to ensure there are sufficient reactive resources located throughout the electric system to maintain post-transient voltage stability for system normal conditions and certain contingencies.

IV. SYSTEM PERFORMANCE

A. Power Flow Studies

1. Normal (Base Case Conditions)

- Voltage Levels
  - a. General
    - i. 500 kV bus voltages will be maintained between 1.05 and 1.08 pu on a 500 kV base.
    - ii. 345 kV bus voltage will be maintained between .99 and 1.04 pu on a 345 kV base.
    - iii. 500 kV and 345 kV system voltages are used to maintain proper 230 kV voltages.
    - iv. Voltage on the 230 kV and 115 kV systems should be between 1.01 and 1.05 pu.
    - v. Tap settings for 230/69 kV and 345/69 kV transformers should be used to maintain low side (69 kV) voltages between 1.03 and 1.04 pu. Seasonal tap changes may be required.
  - b. Specific Buses
    - i. APS Pinnacle Peak 230 kV bus voltage should be between 1.025 and 1.035 pu.
    - ii. Saguaro 115 kV bus voltage will be approximately 1.035 pu.

iii. Westwing 230 kV bus voltage should be between 1.04 and 1.05 pu.

iv. Voltage at the Prescott (DOE) 230 kV bus should be approximately 1.02 pu.

- Facility Loading Limits

a. Transmission Lines

EHV transmission line loading cannot exceed 100% of the continuous rating, which is based upon established conductor temperature limit or sag limitation as defined by APS latest estimates for NERC Standard FAC-008-3.

b. Underground Cable

Underground cable loading should not exceed 100% of the continuous rating with all elements in service. This rating is based on a cable temperature of 85°C with no loss of cable life.

c. Transformers

For all transformers pre-disturbance flows cannot exceed APS established continuous ratings using methodologies used in reporting ratings under NERC Standard FAC-008-3.

d. Series Capacitors

Series Capacitors cannot exceed 100% of continuous rating as determined using methodologies used in reporting ratings under NERC Standard FAC-008-3.

- Interchange of VARS

Interchange of VARs between companies at interconnections will be reduced to a minimum and maintained near zero.

- Distribution of Flow

Schedules on a new project will be compared to simulated power flows to ensure a reasonable level of flowability.

2. Single and selected Double Contingency Outages

- Voltage Levels

Maximum voltage deviation on APS' major buses cannot exceed 5% for single contingencies and 10% for selected double contingencies. APS uses the following formulae to calculate voltage deviations for post-disturbance conditions.

$$\%Deviation = 100x(\frac{Vpre - Vpost}{Vpre})$$

- Facilities Loading Limits
    a. Transmission Lines

    Transmission line loading cannot exceed 100% of the lesser of the sag limit or the emergency rating (30-minute rating) which is based upon established conductor temperature limits.

    b. Underground Cable

    Underground cable loading should not exceed the emergency rating during a single-contingency outage. This rating is based on a cable temperature of 105°C for two hours of emergency operation with no loss of cable life.

    c. Transformers

    For all transformers post-disturbance flows cannot exceed APS established emergency ratings using methodologies used in reporting ratings under NERC Standard FAC-008-3.

    d. Series Capacitors

    Series Capacitors cannot exceed 100% of emergency rating as determined using methodologies used in reporting ratings under NERC Standard FAC-008-3.

- Generator Units

Generator units used for controlling remote voltages will be modified to hold their base case terminal voltages.

- Impact on Interconnected System

Single and selected double contingency outages will not cause overloads upon any neighboring transmission system.

B. Transient Stability Studies

Transient stability studies are primarily performed on the 500 kV and 345 kV systems but may be performed on lower voltage systems depending on the study objectives.

1. Fault Simulation

Three-phase and single-line-to-ground faults initiated disturbances will be simulated according to the guidelines described in NERC Table 1 as well as WECC Regional Criteria TPL-001-WECC-CRT-2. Normal clearing times for different voltage levels are given Table 3 for new facilities. Fault damping will be applied when applicable at fault inception.

Table 3. Normal clearing times for new facilities.

Voltage level	Normal clearing times
500 & 345 kV	4 cycle
230 kV	5 cycle
115 kV	5 cycle
69 kV	7 cycle

2. Series Capacitor Switching

All of APS's designed and installed series capacitor units are protected from internal faults using MOV and by-pass elements. For transient stability analysis, models are used to represent the mitigation provided by the MOV components or through by-passing of the series capacitors.

3. System Stability

The system performance will be considered acceptable if the following conditions are met:

- All machines in the system remain synchronized as demonstrated by the relative rotor angles.
- Positive system damping exists as demonstrated by the damping of relative rotor angles and the damping of voltage magnitude swings. For N-1 and N-2 disturbances, APS follows the voltage and frequency

performance guidelines as described in NERC's Table 1 and WECC Regional Criteria TPL-001-WECC-CRT-2.

- Cascading does not occur for any category contingency.

4. Re-closing

Automatic re-closing of circuit breakers controlling EHV facilities is not utilized.

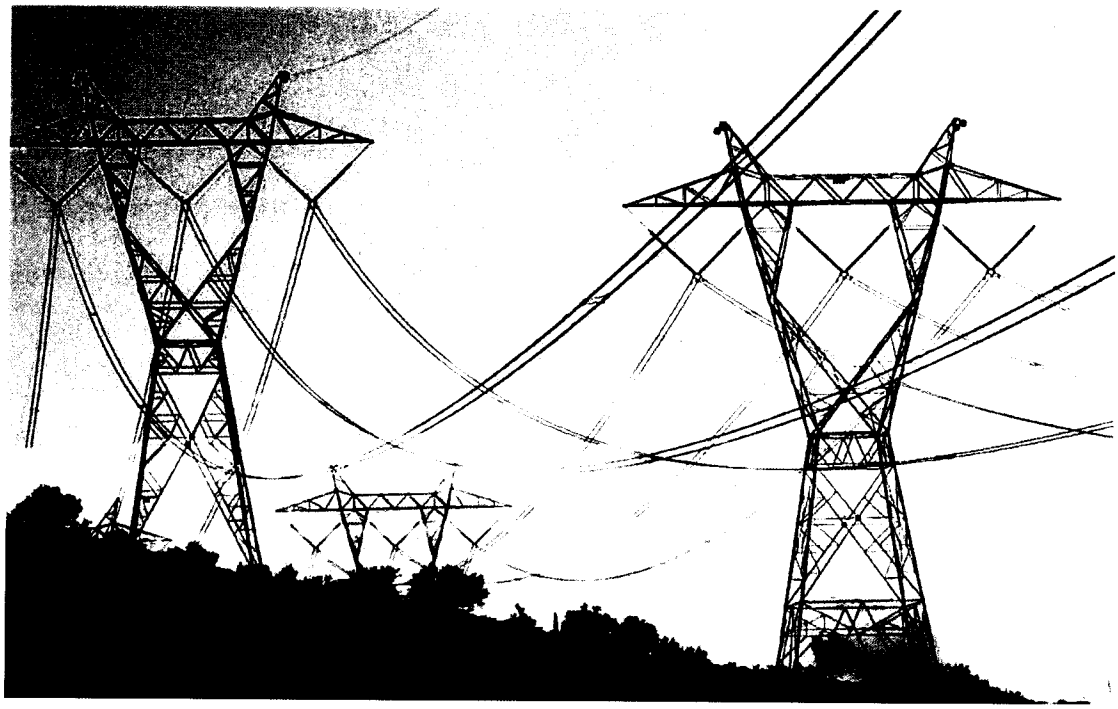
5. Short Circuit Studies

Fault current shall not exceed 100% of the applicable breaker fault current interruption capability for three-phase or single-line-to-ground faults.

6. Reactive Power Margin Studies

For system normal conditions or single contingency conditions, post-transient voltage stability is required with a path or load area modeled at a minimum of 105% of the path rating or maximum planned load limit for the area under study, whichever is applicable. For multiple contingencies, post-transient voltage stability is required with a path or load area modeled at a minimum of 102.5% of the path rating or maximum planned load limit for the area under study, whichever is applicable.

2013 SYSTEM RATING MAPS



PREPARED BY

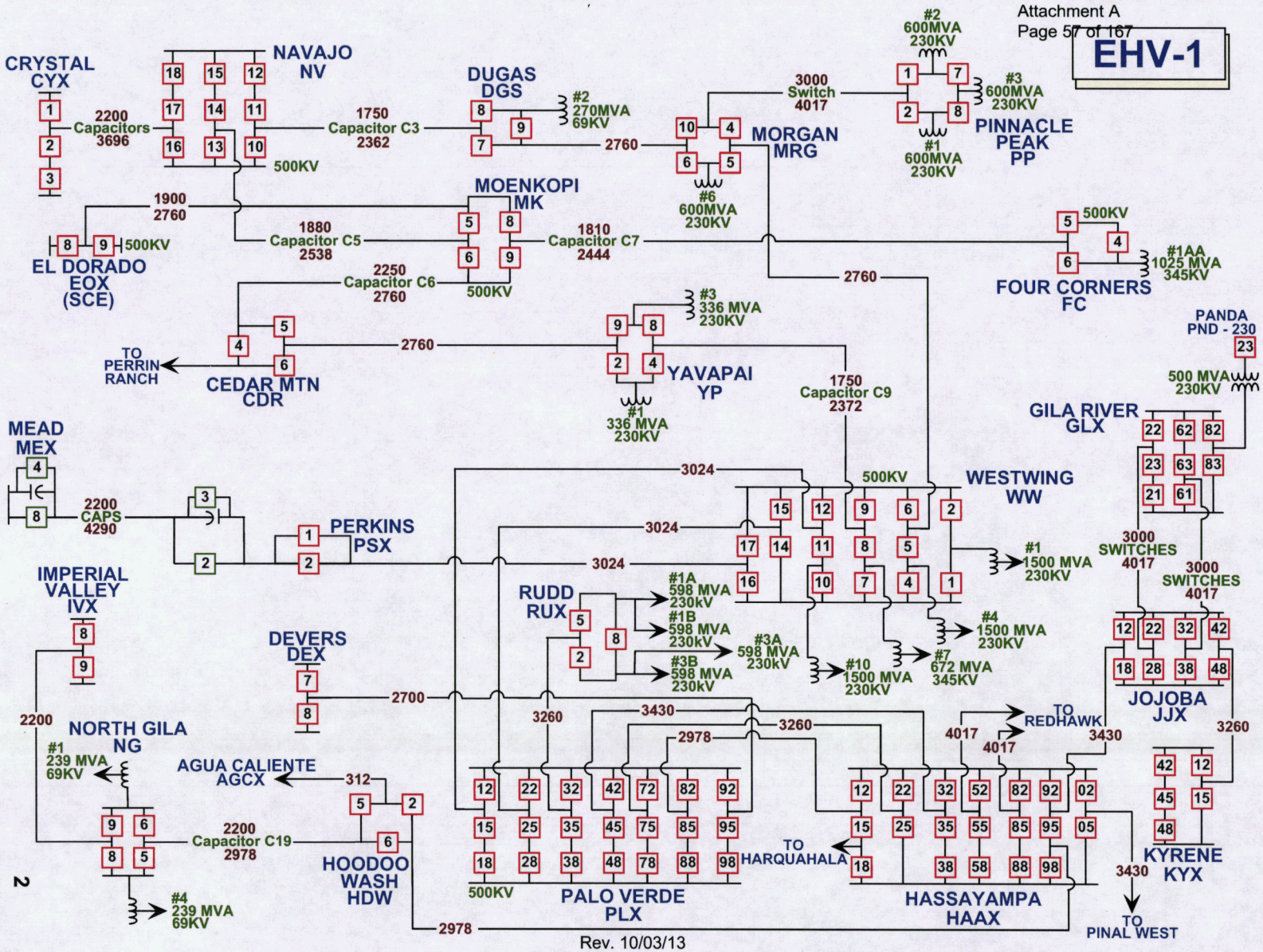
Daniel Haughton
Simeon Onwuzuligbo
Joe Medina
September 2013

TABLE OF CONTENTS

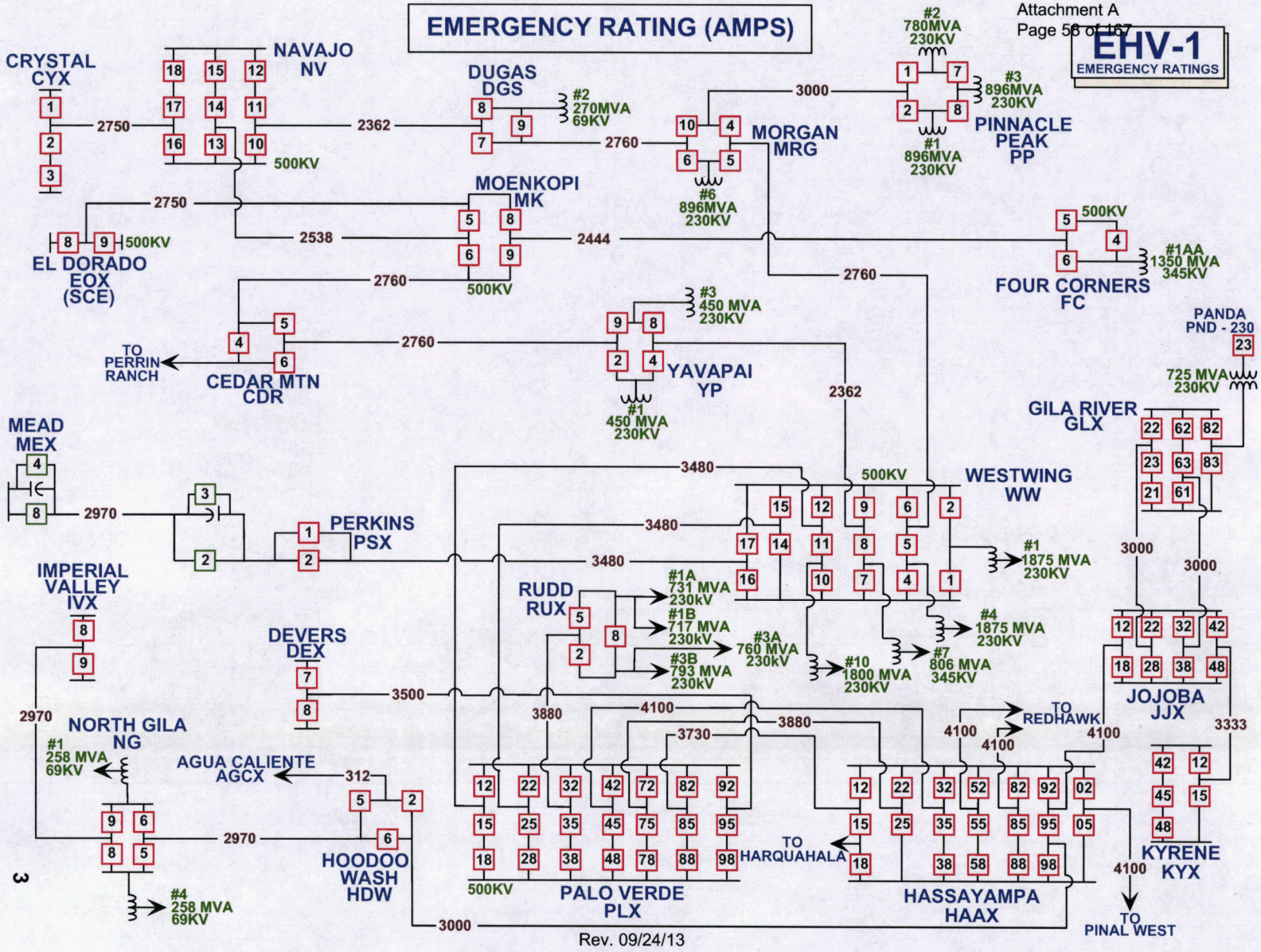
LEGEND
SYSTEM RATING MAPS

SYMBOL	DESCRIPTION
###	CURRENT LIMIT IN AMPS
— ### —	LIMITING ELEMENT
###	CONDUCTOR LIMIT IN AMPS
	TRANSFORMER LIMITS ARE IN MVA
————	OVERHEAD TRANSMISSION LINE
– – – – – –	UNDERGROUND CABLE
M	MOTOR OPERATED SWITCH
V	VACCUM SWITCH
H	HYDRAULIC SWITCH
1	BREAKER NUMBER

EHV-1

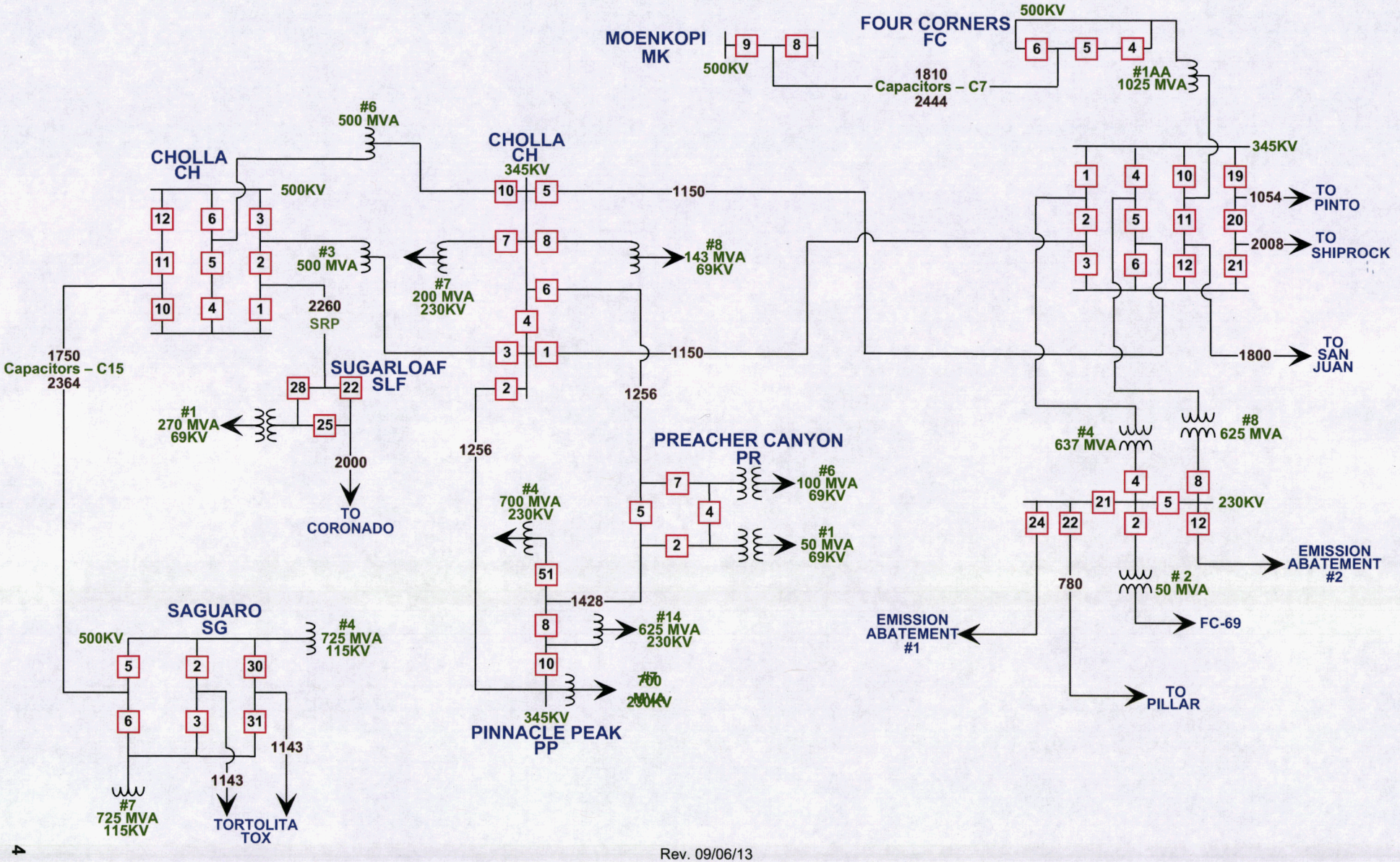


Rev. 10/03/13


EMERGENCY RATING (AMPS)
EHV-1
EMERGENCY RATINGS
CRYSTAL CYX
NAVAJO NV
500KV
2750
2362
DUGAS DGS
#2 270MVA 69KV
2760
3000
MORGAN MRG
#2 780MVA 230KV
#3 896MVA 230KV
#1 896MVA 230KV
#6 896MVA 230KV
PINNACLE PEAK PP
MOENKOPI MK
2538
2444
EL DORADO EOX (SCE)
500KV
FOUR CORNERS FC
#1AA 1350 MVA 345KV
TO PERRIN RANCH
CEDAR MTN CDR
YAVAPAI YP
#3 450 MVA 230KV
#1 450 MVA 230KV
PANDA PND - 230
725 MVA 230KV
GILA RIVER GLX
MEAD MEX
2970
PERKINS PSX
3480
WESTWING WW
#1 1875 MVA 230KV
#4 1875 MVA 230KV
#7 806 MVA 345KV
#10 1800 MVA 230KV
#3A 760 MVA 230KV
#3B 793 MVA 230KV
#1A 731 MVA 230KV
#1B 717 MVA 230KV
RUDD RUX
IMPERIAL VALLEY IVX
DEVERS DEX
3500
3000
JOJOBA JJX
3333
NORTH GILA NG
#1 258 MVA 69KV
#4 258 MVA 69KV
AGUA CALIENTE AGCX
312
HOODOO WASH HDW
3880
4100
3730
TO REDHAWK
TO HARQUAHALA
PALO VERDE PLX
HASSAYAMPA HAAX
KYRENE KYX
TO PINAL WEST

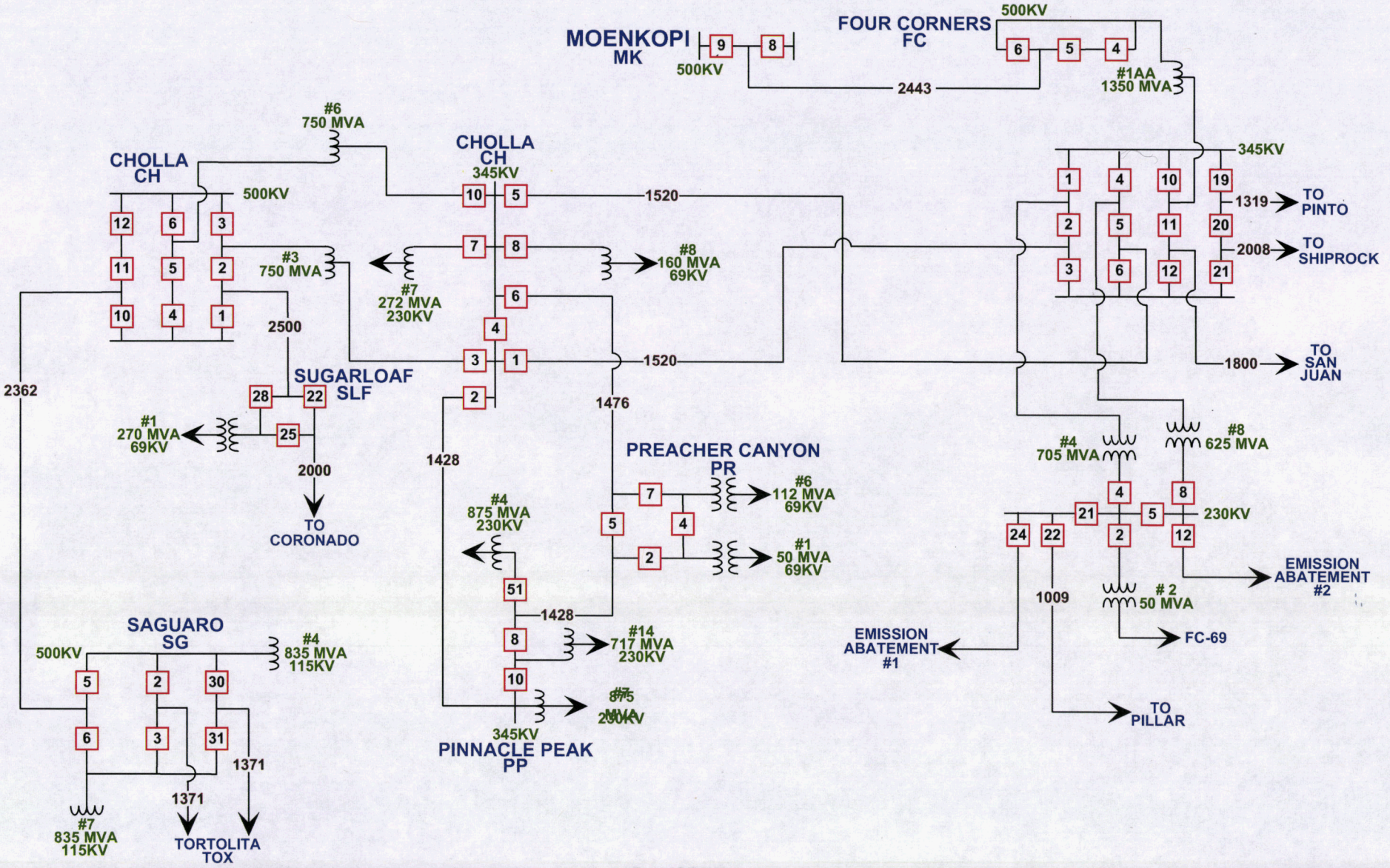
Rev. 09/24/13

EHV-2

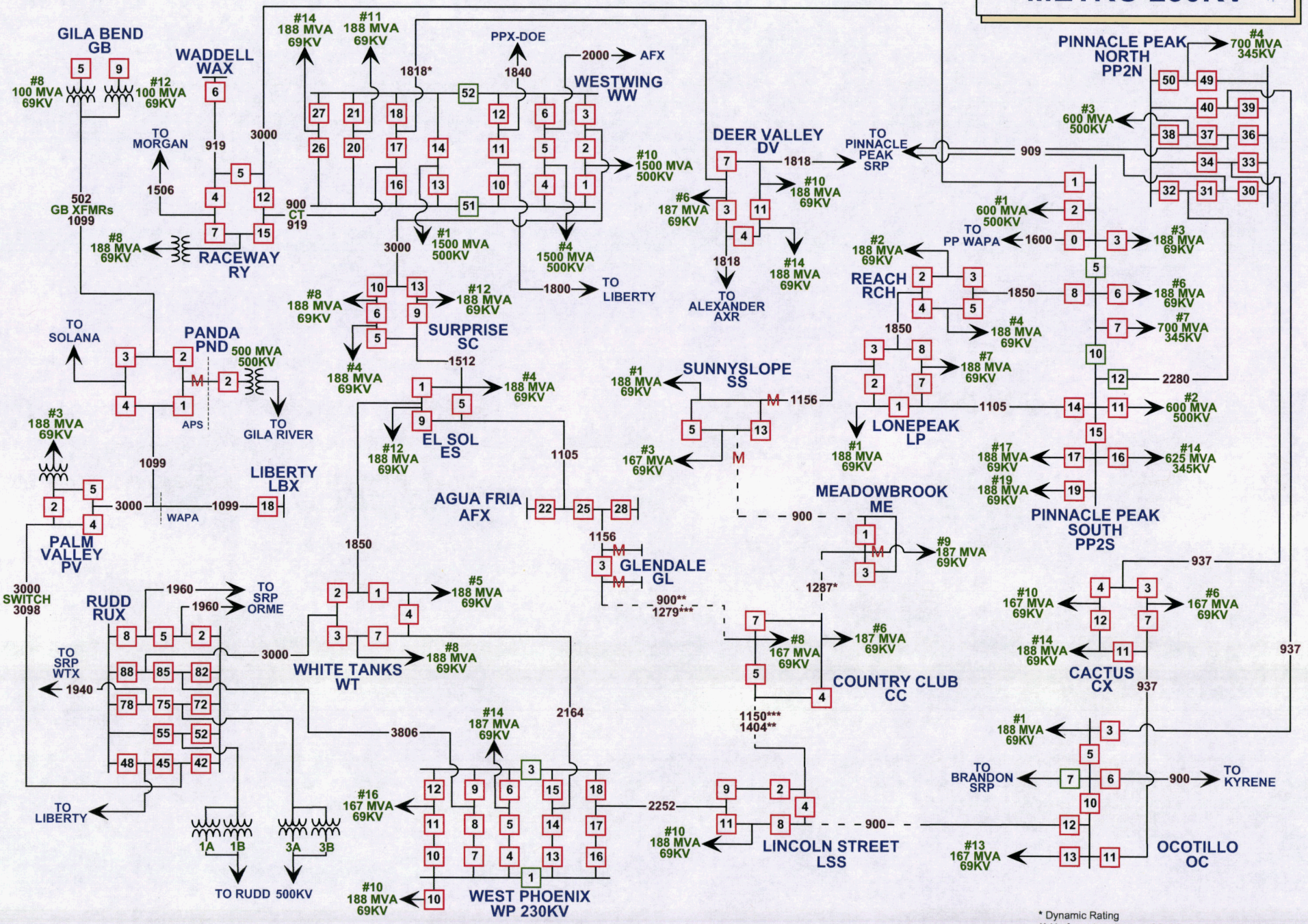

MOENKOPI
MK
500KV
9
8
FOUR CORNERS
FC
500KV
6
5
4
#1AA
1025 MVA
1810
Capacitors – C7
2444
#6
500 MVA
CHOLLA
CH
500KV
12
6
3
11
5
2
10
4
1
#3
500 MVA
2260
SRP
1750
Capacitors – C15
2364
SUGARLOAF
SLF
28
22
25
#1
270 MVA
69KV
2000
TO
CORONADO
CHOLLA
CH
345KV
10
5
1150
7
8
#8
143 MVA
69KV
#7
200 MVA
230KV
6
4
3
1
1150
2
1256
1256
PREACHER CANYON
PR
7
#6
100 MVA
69KV
5
4
2
#1
50 MVA
69KV
#4
700 MVA
230KV
51
1428
8
#14
625 MVA
230KV
10
#7
700
MVA
230KV
345KV
PINNACLE PEAK
PP
345KV
1
4
10
19
1054
TO
PINTO
2
5
11
20
2008
TO
SHIPROCK
3
6
12
21
1800
TO
SAN
JUAN
#4
637 MVA
#8
625 MVA
4
8
21
5
230KV
24
22
2
12
EMISSION
ABATEMENT
#2
780
2
50 MVA
FC-69
EMISSION
ABATEMENT
#1
TO
PILLAR
SAGUARO
SG
500KV
#4
725 MVA
115KV
5
2
30
6
3
31
1143
1143
#7
725 MVA
115KV
TORTOLITA
TOX

EMERGENCY RATING (AMPS)

EHV-2
EMERGENCY RATINGS

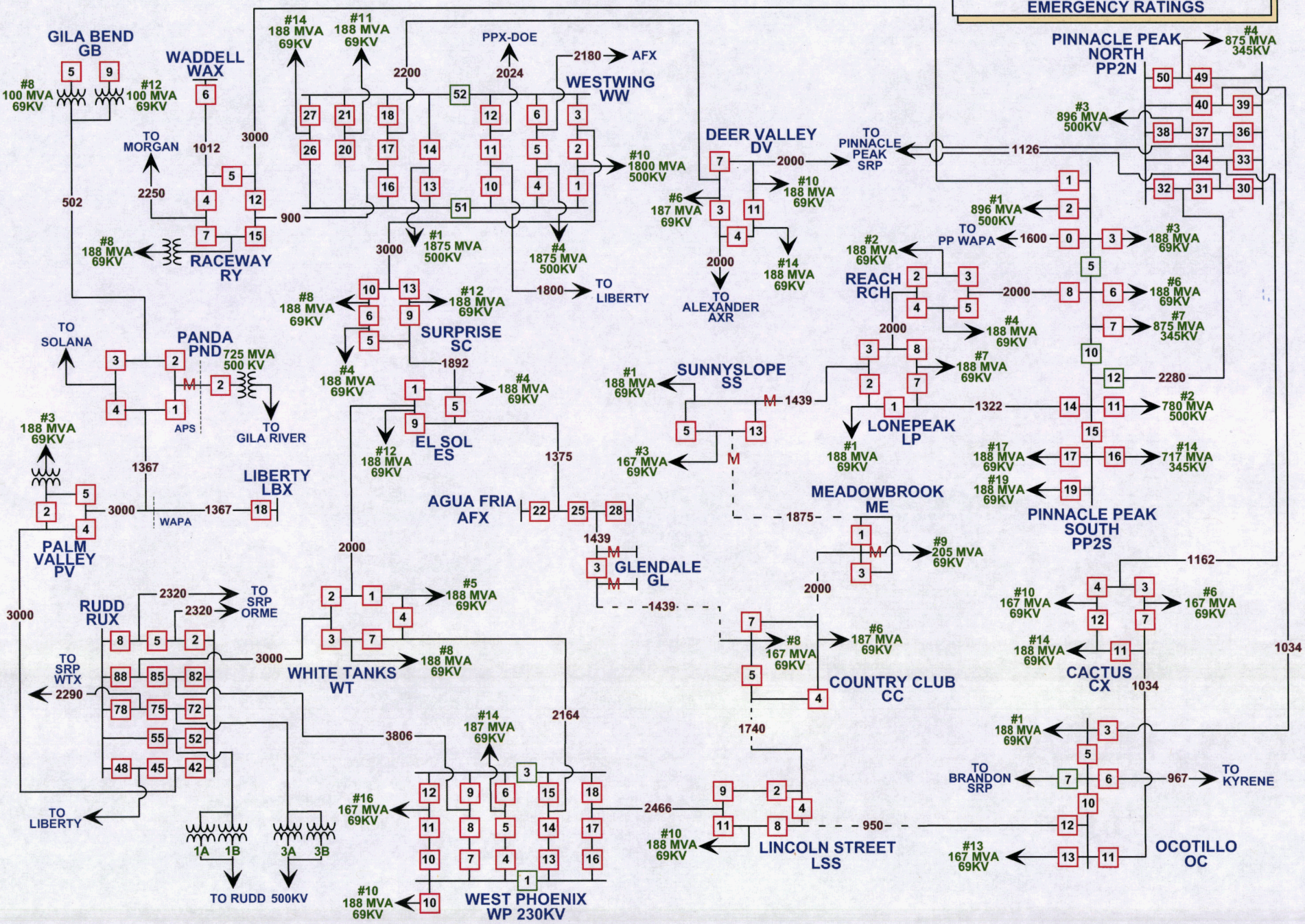


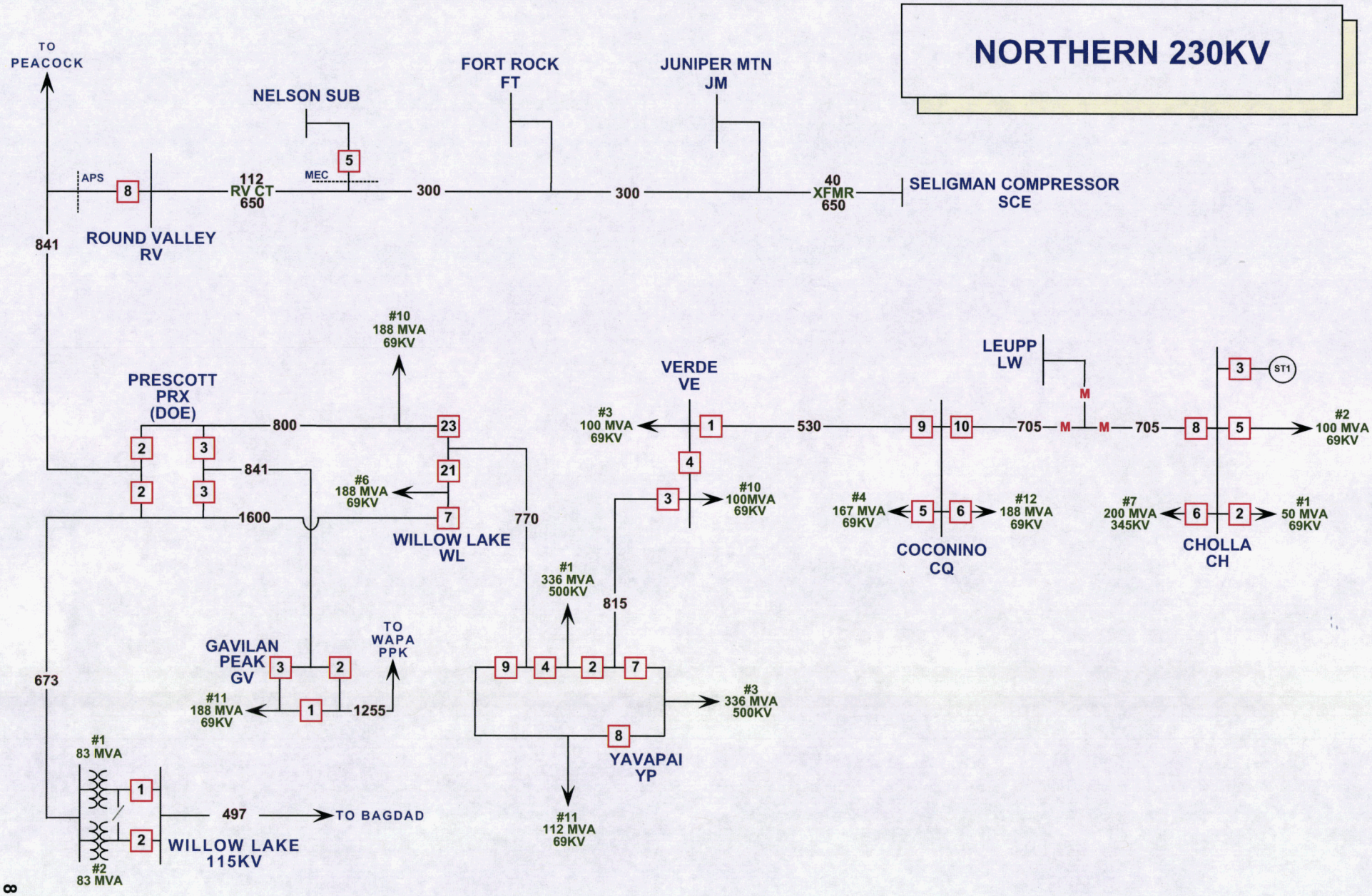
METRO 230KV



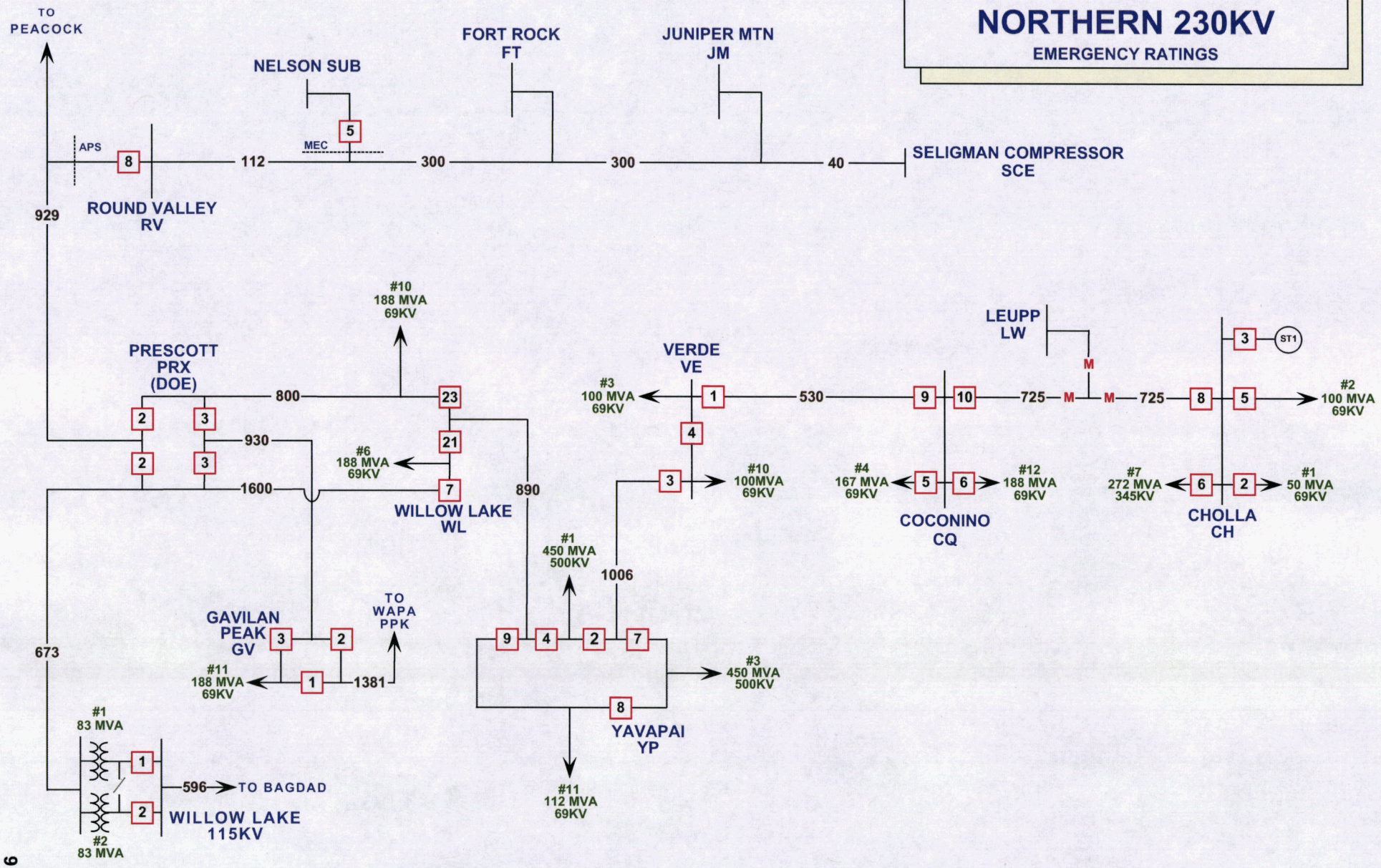
* Dynamic Rating
** No forced cooling on GT-CC, Cooling both ends LS-CC
*** Forced cooling on GT-CC, Cooling one end LS-CC

METRO 230KV
EMERGENCY RATINGS

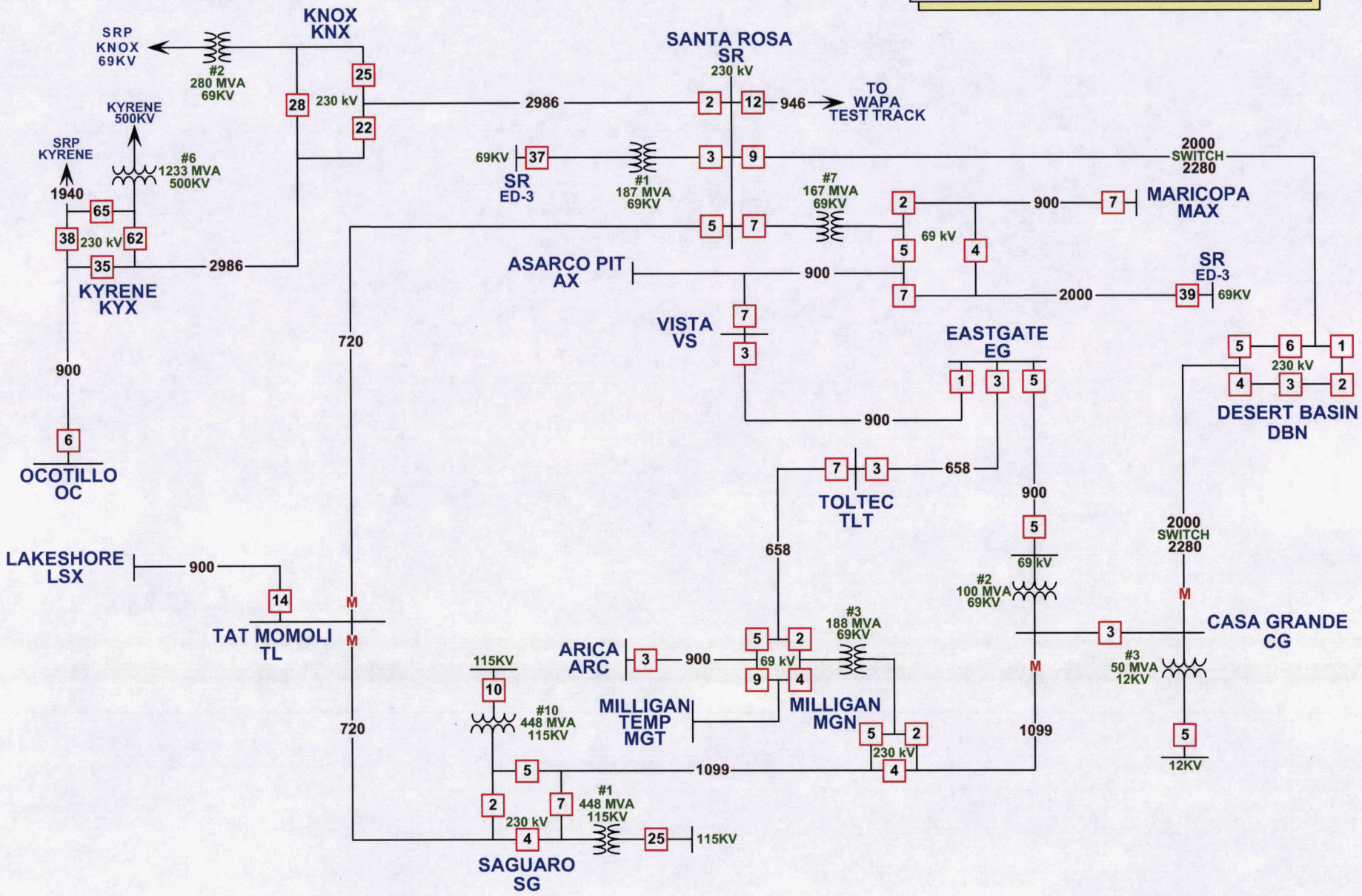



NORTHERN 230KV
TO PEACOCK
NELSON SUB
FORT ROCK FT
JUNIPER MTN JM
APS
MEC
112 RV CT 650
300
300
40 XFMR 650
SELIGMAN COMPRESSOR SCE
841
ROUND VALLEY RV
#10 188 MVA 69KV
PRESCOTT PRX (DOE)
800
841
1600
#6 188 MVA 69KV
WILLOW LAKE WL
770
VERDE VE
#3 100 MVA 69KV
530
#10 100MVA 69KV
LEUPP LW
705
705
#2 100 MVA 69KV
#4 167 MVA 69KV
#12 188 MVA 69KV
COCONINO CQ
#7 200 MVA 345KV
#1 50 MVA 69KV
CHOLLA CH
ST1
673
GAVILAN PEAK GV
#11 188 MVA 69KV
1255
TO WAPA PPK
#1 336 MVA 500KV
815
#3 336 MVA 500KV
YAVAPAI YP
#11 112 MVA 69KV
#1 83 MVA
#2 83 MVA
497
TO BAGDAD
WILLOW LAKE 115KV

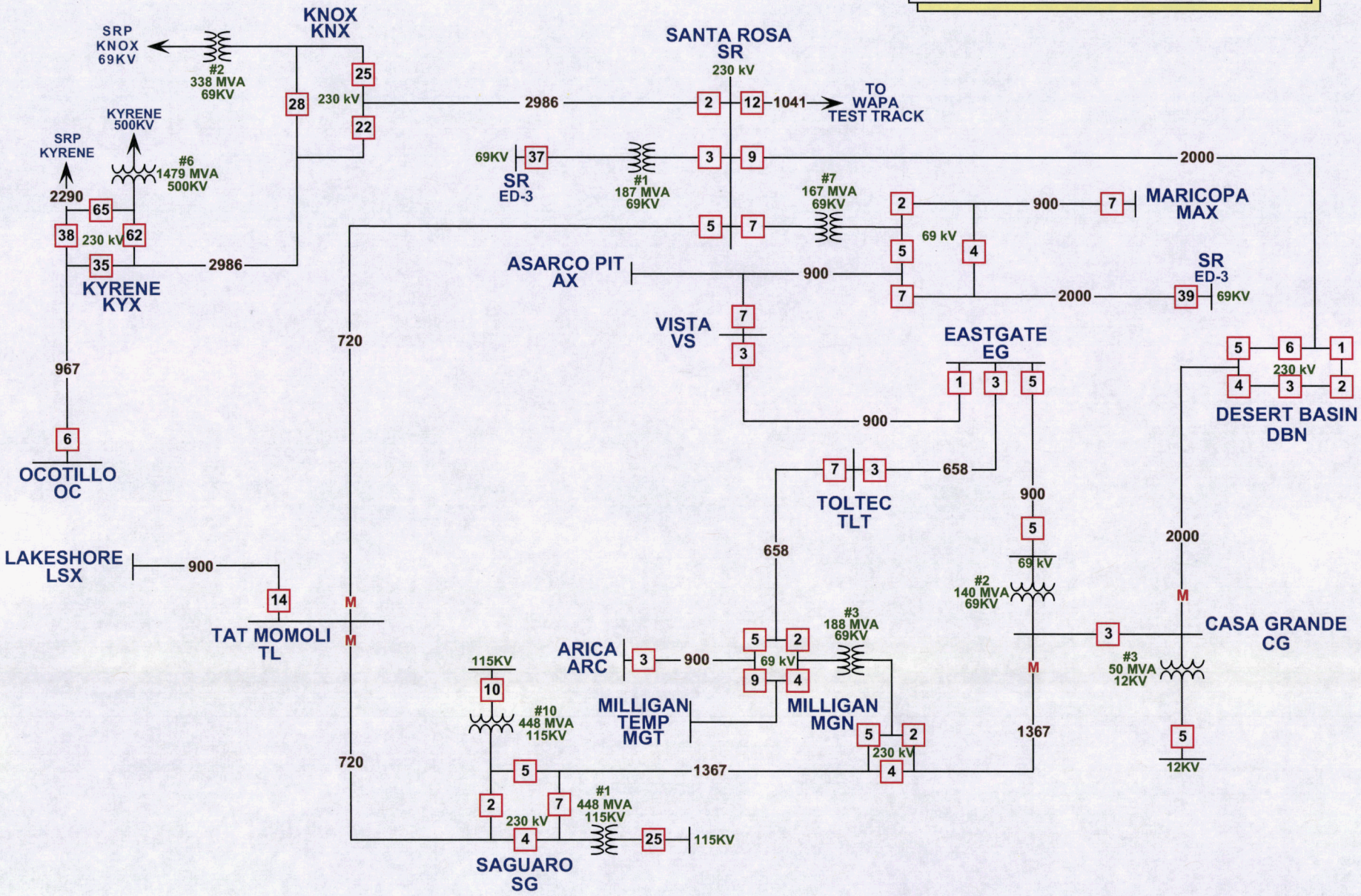
NORTHERN 230KV
EMERGENCY RATINGS



SOUTHERN 230KV



SOUTHERN 230KV
EMERGENCY RATINGS



ARIZONA PUBLIC SERVICE COMPANY

TEN-YEAR TRANSMISSION SYSTEM PLAN

2014 – 2023

TECHNICAL STUDY REPORT

FOR

THE ARIZONA CORPORATION COMMISSION

JANUARY 2014

Executive Summary

Pursuant to North American Electric Reliability Corporation ("NERC") Standard TPL-001 "System Performance Under Normal (No Contingency) Conditions (Category A)", Arizona Public Service Company ("APS") performs annually a Category A analysis. The Category A analysis is performed for system conditions listed in Table I of the NERC/WECC Planning standards.

Results of the study indicate that, with the projects identified in APS's Ten-Year Transmission System Plan, APS is fully compliant with NERC Standard TPL-001.

Pursuant to NERC Standard TPL-002 "System Performance Following Loss of a Single Bulk Electric System Element (Category B)", APS performs annually a Category B contingency analysis. In Table I of the NERC/WECC planning standards, there are a total of four different Category B events that are to be studied each year to meet NERC Standard TPL-002.

A comprehensive list of contingencies was developed for the Category B contingency analysis and performed for the system conditions listed in Table I of the NERC/WECC Planning standards based on engineering judgment. APS believes that the selection of contingencies for inclusion in these studies, which is based on Category B of Table I of the NERC/WECC Planning standards, is acceptable to WECC. If requested by WECC, APS will implement measures to correct any deficiencies that have been identified by WECC.

Results of the study indicate that, with the projects identified in APS's Ten-Year Transmission System Plan, APS is fully compliant with NERC Standard TPL-002.

Table of Contents

ARIZONA PUBLIC SERVICE COMPANY
2014-2023
TEN-YEAR TRANSMISSION SYSTEM PLAN
TECHNICAL STUDY REPORT

I. Introduction

This technical study report is performed and filed annually with the Arizona Corporation Commission ("Commission") pursuant to ARS § 40-360.02 and Decision No. 63876 (July 25, 2001). This report summarizes the results of power flow analyses and stability analyses for the Arizona Public Service Company ("APS") transmission system.

Power flow analyses were conducted for every year within the ten year planning window (2014-2023) and performed for two scenarios: (i) assumption that all transmission system elements are in service and within continuous ratings (Category A); and (ii) assumption of an outage on a single element, with all remaining system elements remaining within emergency ratings (Category B). Voltage deviations for these scenarios must also be within established guidelines. These voltage deviation guidelines closely approximate post-transient Volt Ampere Reactive ("VAR") margin requirements of the Western Electricity Coordinating Council ("WECC"). More detail is provided in APS's Transmission Planning Process and Guidelines, which is also included in the annual APS Ten-Year Transmission System Plan ("Ten-Year Plan") filing.

The stability analyses were performed to simulate electrical disturbances on the transmission system and evaluate the system response. The desired result is that all generators will remain on line, no additional lines will open, and the system oscillations will damp out.

Results of the power flow and stability analyses aid in determining when and where new electrical facilities are needed because of reliability or security reasons. Additionally, some facilities are planned to address adequacy concerns. These include the interconnection of generation to the transmission system or efforts to increase import capability and/or export/scheduling capability to load-constrained or other areas.

II. Base Case Development

Power flow cases were created for each year of the 2014-2023 study time frame. These cases were developed from the latest available WECC heavy summer power flow cases.

The 2013 heavy summer operating case was chosen as the first bulk seed case. This case was developed from a 2013 WECC heavy summer base case, and then updated in a coordinated effort between Arizona utilities, as well as the Imperial Irrigation District, to include the sub-transmission and distribution models. This case was used as

the seed case in the creation of the 2014-2017 power flow cases used for the power flow analyses performed for the 2014-2023 Ten-Year Plan. Each intermediate case developed was updated with the forecasted loads and any system additions/upgrades that are planned in the respective year.

The second seed case chosen was the 2018 heavy summer power flow case that was developed through the CATS and SATS sub-committees of SWAT. In a collaborative effort, the Arizona utilities used the jointly developed 2018 case to develop a 2018 summer case that included the sub-transmission and distribution systems of the Arizona utilities. This seed case was used to develop the 2019-2022 power flow cases. Each intermediate case developed was updated with the forecasted loads and any system additions/upgrades that are planned in the respective year.

The third and final seed case chosen was the 2023 heavy summer power flow case that was also developed through the CATS and SATS sub-committees of SWAT. This seed case was not used to develop any other power flow cases. In addition, the 2023 seed case was updated with the forecasted loads and any system additions/upgrades that were planned.

The forecasted loads modeled within all the power flow base cases include the effects of distributed renewable generation as well as energy efficiency programs. In addition, the forecasted loads are based on the most recent data at the time the cases are constructed[1].

These cases represent the latest transmission and sub-transmission plans, load projections, and resource plans of utilities and independent power producers. By utilizing WECC base cases, all loads, resources, firm power transfers, and planned projects within the WECC system are represented. By using jointly developed seed cases the most accurate Arizona system is represented.

[1] Load forecasts for the 2014-2023 TYP are based on APS load forecasts as of Q1 2013 that incorporate demand side management and energy efficiency, including distributed generation.

III. Power Flow Analyses

Base case and single contingency conditions are evaluated to determine system needs and timing. Various iterations of possible solutions lead to the final plans for transmission additions. The contingency analysis involves simulations for every non-radial 115kV or above line that APS owns, partially owns, or operates. Transformer as well as generator outages are also evaluated. A comprehensive list of contingencies can be found in Appendix A. Due to the size of each year's contingency list , only one year is included as an example.

The APS system includes several reactive power resources that are used to maintain bus voltages within the limits defined by APS's Transmission Planning Process & Guidelines. These reactive power resources include shunt devices, series compensation, and tap changing transformers. The reactive power resources are adequate and meet the system performance.

APS does not have any additional existing or planned voltage or power flow control devices except those noted in the preceding paragraph. These devices exist outside the APS control area; however, they are not utilized or their operation is not necessary as a result of the contingencies in this study.

No planned outage of bulk electric equipment at APS occurs during the heavy summer peak time. Therefore, it is not necessary to study planned outages since this Ten-Year Plan study focuses on the heavy summer peak time.

Results of the power flow studies are tabulated in a Security Needs Table and an Adequacy Needs Table, as shown below. These tables identify 9 transmission projects that are included in this Ten-Year Plan filing. Some of the projects were classified as Adequacy Needs because of the uncertainty of generation location, project size, and transmission availability in the later years. As projects near the five-year planning time frame, they may be redefined as Security Needs projects. For the projects included in the Security Needs Table, selected maps of the power flow simulations are contained in Appendix B showing the pre-project scenario (outage and resulting violation) and the post-project scenario (outage and no criteria violations).

Table 1: Security Needs Table

Transmission Project	In Service Year	Critical Outage	Limiting Element/Condition	Map
Palm Valley-TS2-Trilby Wash 230kV Line and Trilby Wash 230/69kV Substation	2015	Javelina – Surprise 69kV line	Overloads Surprise - Dysart 69kV line	B2-B3
Mazatzal 345/69kV Substation	2017	Preacher Canyon – Owens– Tonto 69kV line	Voltage deviations on the sub-transmission system in the area resulting in load shedding. Also overloads the Childs-Irving-Strawberry 69kV line.	B4-B5

Table 2: Adequacy Needs Table

Transmission Project	In Service Year	System Benefits
Palo Verde Hub-North Gila 500kV #2 Line	2015	Increases import capability for the Yuma area and export/scheduling capability from the PV area to provide access to both solar and gas resources. Increases transmission system reliability and ability to deliver power from these resources.
Palo Verde-Delaney 500kV Line	2016	Increases the export scheduling capability from the Palo Verde ("PV") area to provide access to both solar and gas resources. The project is also to provide for the interconnection of 4 solar generation projects into the Delaney switchyard.
Delaney-Sun Valley 500kV Line	2016	Increases the import capability for the Phoenix Metropolitan area and export/scheduling capability from the PV area to provide access to both solar and gas resources. Along with the Sun Valley-Trilby Wash 230kV line, provides a new Transmission source for power in the far north and west sides of the Phoenix Metropolitan transmission system.
Sun Valley-Trilby Wash 230kV Line	2016	Provides a second 230kV source for Trilby Wash so that it is not served as a radial substation, thereby increasing the local system reliability. With the 500kV source at Sun Valley, the project provides a new source for power in the far north and west sides of the Phoenix Metropolitan transmission system.
Sun Valley-Morgan 500kV Line	2018	Increases import capability for the Phoenix Metropolitan area and export/scheduling capability from the PV area which includes both solar and gas resources. Increases transmission system reliability and ability to deliver power from these resources. Provides a second 500kV source for the Sun Valley substation. Provides support for multiple transmission corridor contingencies.
North Gila-Orchard 230kV Line	2018	Increases transmission system reliability and ability to distribute and deliver power within the Yuma area.

IV. Stability Analyses

A stability simulation for simulated three-phase faults was performed for 2018 and 2023 for every non-radial 345kV and 500kV, and select 230kV lines that APS owns (totally or partially) or operates. It has been APS's experience that stability concerns do not manifest on the sub-transmission system, which is primarily designed to deliver power to load. Therefore, no simulations were performed at voltage levels less than 115kV, with the possible exception of generators or generator step up transformers at the generator substation. Additionally, every new proposed generation plant will be required to perform stability evaluations prior to receiving permission to interconnect to the transmission system. A list of the transmission elements included in the stability analyses can be found in Appendices C and D.

Existing and planned protection systems are utilized in the study, including any backup or redundant system, and represent fault clearing times, the operation of the protection system, and the resulting removal of the facility that would occur as a result of the simulated event. Each simulation modeled a 3-phase bus fault, appropriate series capacitor flashing and reinsertion, fault removal, and transmission line removal. System performance was evaluated by monitoring representative generator rotor angles, bus voltages and system frequency. Plots of these system parameters are available upon request. The stability simulations performed to date indicate that no stability problems limit the transmission system.

V. Category A & B Contingency Study Results

A high level overview of the results for the Category A and Category B contingences is shown in Table 3 below. From this table, it is shown that each of the Category A and Category B contingencies meets the NERC/WECC Planning Standards.

Table 3: Overview of Category A & B Standard Results

		1-5 year Time Frame		6-10 year Time Frame	
	NERC Planning Standards Category A	**Case Years Studied**	**Standards Met?**	**Case Years Studied**	**Standards Met?**
1	All Facilities in Service	2014 through 2018	Yes	2019 through 2023	Yes
		1-5 year Time Frame		**6-10 year Time Frame**	
	NERC Planning Standards Category B	**Case Years Studied**	**Standards Met?**	**Case Years Studied**	**Standards Met?**
1	3-Phase Fault with Normal Clearing – Generator	2014 through 2018	Yes	2019 through 2023	Yes
2	3-Phase Fault with Normal Clearing – Transmission Circuit	2014 through 2018	Yes	2019 through 2023	Yes
3	3-Phase Fault with Normal Clearing – Transformer	2014 through 2018	Yes	2019 through 2023	Yes
4	Loss of an Element without a Fault	2014 through 2018	Yes	2019 through 2023	Yes

Table 3 is a high level summary that shows, with the projects listed in Tables 1 & 2, the APS system meets the criteria listed in NERC Standards TPL-001 and TPL-002.

Due to the size of the transient stability, power flow thermal, and voltage steady state analyses, the detailed results are not included. However, they are available upon request by WECC or any other authorized stakeholder.

APPENDIX A

Representative Steady-State Contingency List

(2014 used as an example year)

2014 Single Contingency List (Category B)		
Contingency Number	**Type**	**Contingency Name**
line_1	Line	Line $ROGERS 69.0 to ROGERS 69.0 Circuit 1
line_2	Line	Line SAN_JUAN 345.0 to MCKINLEY 345.0 Circuit 1
line_3	Line	Line SAN_JUAN 345.0 to MCKINLEY 345.0 Circuit 2
line_4	Line	Line MACHO_SPRNGS 345.0 to SPRINGR 345.0 Circuit 1
line_5	Line	Line HIDALGO 345.0 to GREENLEE 345.0 Circuit 1
line_6	Line	Line CHOLLA 500.0 to SAGUARO 500.0 Circuit 1
line_7	Line	Line FOURCORN 500.0 to MOENKOPI 500.0 Circuit 1
line_8	Line	Line MOENKOPI 500.0 to YAVAPAI 500.0 Circuit 1
line_9	Line	Line MOENKOPI 500.0 to CEDARMT 500.0 Circuit 1
line_10	Line	Line MOENKOPI 500.0 to ELDORDO 500.0 Circuit 1
line_11	Line	Line MOENKOPI 500.0 to MARKETPL 500.0 Circuit 1
line_12	Line	Line NAVAJO 500.0 to MOENKOPI 500.0 Circuit 1
line_13	Line	Line NAVAJO 500.0 to DUGAS 500.0 Circuit 1
line_14	Line	Line NAVAJO 500.0 to CRYSTAL 500.0 Circuit 1
line_15	Line	Line SAGUARO 500.0 to TORTOLIT 500.0 Circuit 1
line_16	Line	Line SAGUARO 500.0 to TORTOLIT 500.0 Circuit 2
line_17	Line	Line SAGUARO 500.0 to TORTLIT2 500.0 Circuit 1
line_18	Line	Line WESTWING 500.0 to MORGAN 500.0 Circuit 1
line_19	Line	Line YAVAPAI 500.0 to WESTWING 500.0 Circuit 1
line_20	Line	Line MORGAN 500.0 to PNPKAPS 500.0 Circuit 1
line_21	Line	Line CEDARMT 500.0 to YAVAPAI 500.0 Circuit 1
line_22	Line	Line SGRLF 500.0 to CHOLLA 500.0 Circuit 1
line_23	Line	Line DUGAS 500.0 to MORGAN 500.0 Circuit 1
line_24	Line	Line CHOLLA 345.0 to PNPKAPS 345.0 Circuit 1
line_25	Line	Line CHOLLA 345.0 to PRECHCYN 345.0 Circuit 1
line_26	Line	Line FOURCORN 345.0 to SAN_JUAN 345.0 Circuit 1
line_27	Line	Line FOURCORN 345.0 to WESTMESA 345.0 Circuit 1
line_28	Line	Line FOURCORN 345.0 to RIOPUERC 345.0 Circuit 1
line_29	Line	Line FOURCORN 345.0 to CHOLLA 345.0 Circuit 1
line_30	Line	Line FOURCORN 345.0 to CHOLLA 345.0 Circuit 2
line_31	Line	Line PRECHCYN 345.0 to PNPKAPS 345.0 Circuit 1
line_32	Line	Line BUCKEYE 230.0 to BUCKEYE2 230.0 Circuit 1
line_33	Line	Line BUCKEYE 230.0 to LIBERTY 230.0 Circuit 1
line_34	Line	Line CACTUS 230.0 to OCOTILLO 230.0 Circuit 1
line_35	Line	Line CASGRAPS 230.0 to MILLIGAN 230.0 Circuit 1

2014 Single Contingency List (Category B)		
Contingency Number	**Type**	**Contingency Name**
line_36	Line	Line CHOLLA 230.0 to LEUPP 230.0 Circuit 1
line_37	Line	Line CTRYCLUB 230.0 to LINCSTRT 230.0 Circuit 1
line_38	Line	Line CTRYCLUB 230.0 to MEADOWBK 230.0 Circuit 1
line_39	Line	Line CTRYCLUB 230.0 to GRNDTRML 230.0 Circuit 1
line_40	Line	Line DEERVALY 230.0 to WESTWNGE 230.0 Circuit 1
line_41	Line	Line DEERVALY 230.0 to ALEXANDR 230.0 Circuit 1
line_42	Line	Line DEERVALY 230.0 to PINPKSRP 230.0 Circuit 1
line_43	Line	Line EAGLEYE 230.0 to BUCKEYE2 230.0 Circuit 1
line_44	Line	Line EL SOL 230.0 to WHTNKAPS 230.0 Circuit 1
line_45	Line	Line EL SOL 230.0 to AGUAFRIA 230.0 Circuit 1
line_46	Line	Line FOURCORN 230.0 to PILLAR 230.0 Circuit 1
line_47	Line	Line GLENDALE 230.0 to GLENDALW 230.0 Circuit 1
line_48	Line	Line GLENDALE 230.0 to GRNDTRML 230.0 Circuit 1
line_49	Line	Line BUCKEYE2 230.0 to LIBERTY 230.0 Circuit 1
line_50	Line	Line LEUPP 230.0 to COCONINO 230.0 Circuit 1
line_51	Line	Line LINCSTRT 230.0 to WPHXAPSN 230.0 Circuit 1
line_52	Line	Line LONEPEAK 230.0 to SUNYSLOP 230.0 Circuit 1
line_53	Line	Line MEADOWBK 230.0 to SUNYSLOP 230.0 Circuit 1
line_54	Line	Line OCOTILLO 230.0 to LINCSTRT 230.0 Circuit 1
line_55	Line	Line OCOTILLO 230.0 to PPAPS N 230.0 Circuit 1
line_56	Line	Line REACH 230.0 to LONEPEAK 230.0 Circuit 1
line_57	Line	Line PPAPS W 230.0 to PPAPS C 230.0 Circuit 1
line_58	Line	Line PPAPS W 230.0 to PPKWAPA 230.0 Circuit 1
line_59	Line	Line SAGUARO 230.0 to TATMOMLI 230.0 Circuit 1
line_60	Line	Line SNTAROSA 230.0 to TATMOMLI 230.0 Circuit 1
line_61	Line	Line SNTAROSA 230.0 to KNOX 230.0 Circuit 1
line_62	Line	Line SNTAROSA 230.0 to DBG 230.0 Circuit 1
line_63	Line	Line SNTAROSA 230.0 to TESTTRAK 230.0 Circuit 1
line_64	Line	Line SURPRISE 230.0 to EL SOL 230.0 Circuit 1
line_65	Line	Line SURPRISE 230.0 to WESTWNGW 230.0 Circuit 1
line_66	Line	Line WESTWNGW 230.0 to WESTWNGE 230.0 Circuit 1
line_67	Line	Line WHTNKAPS 230.0 to RUDD 230.0 Circuit 1
line_68	Line	Line WPHXAPSS 230.0 to WPHXAPSN 230.0 Circuit 1
line_69	Line	Line YAVAPAI 230.0 to VERDE N 230.0 Circuit 1
line_70	Line	Line KYR-WEST 230.0 to OCOTILLO 230.0 Circuit 1

2014 Single Contingency List (Category B)		
Contingency Number	**Type**	**Contingency Name**
line_71	Line	Line KYR-WEST 230.0 to KNOX 230.0 Circuit 1
line_72	Line	Line GILARIVR 230.0 to GILABEND 230.0 Circuit 1
line_73	Line	Line GILARIVR 230.0 to TS4 230.0 Circuit 1
line_74	Line	Line WPHXAPSN 230.0 to WHTNKAPS 230.0 Circuit 1
line_75	Line	Line FORTROCK 230.0 to RNDVLYAZ 230.0 Circuit 1
line_76	Line	Line FORTROCK 230.0 to JUNIPRMT 230.0 Circuit 1
line_77	Line	Line RACEWAY 230.0 to RACEWYWA 230.0 Circuit 1
line_78	Line	Line VERDE S 230.0 to COCONINO 230.0 Circuit 1
line_79	Line	Line VERDE S 230.0 to VERDE N 230.0 Circuit 1
line_80	Line	Line GLENDALW 230.0 to AGUAFRIA 230.0 Circuit 1
line_81	Line	Line WILOWLKE 230.0 to YAVAPAI 230.0 Circuit 1
line_82	Line	Line WILOWLKE 230.0 to WILOWLKW 230.0 Circuit 1
line_83	Line	Line WILOWLKW 230.0 to PRESCOTT 230.0 Circuit 1
line_84	Line	Line AVERY 230.0 to RACEWAY 230.0 Circuit 1
line_85	Line	Line AVERY 230.0 to SCTWSH 230.0 Circuit 1
line_86	Line	Line SCTWSH 230.0 to PPAPS W 230.0 Circuit 1
line_87	Line	Line TS4 230.0 to PLMVLY 230.0 Circuit 1
line_88	Line	Line TS4 230.0 to LIBERTY 230.0 Circuit 1
line_89	Line	Line PPAPS C 230.0 to REACH 230.0 Circuit 1
line_90	Line	Line PPAPS C 230.0 to PPAPS E 230.0 Circuit 1
line_91	Line	Line PPAPS E 230.0 to LONEPEAK 230.0 Circuit 1
line_92	Line	Line PPAPS E 230.0 to PPAPS N 230.0 Circuit 1
line_93	Line	Line JUNIPRMT 230.0 to SELIGMAN 230.0 Circuit 1
line_94	Line	Line MILLIGAN 230.0 to SAGUARO 230.0 Circuit 1
line_95	Line	Line PPAPS N 230.0 to CACTUS 230.0 Circuit 1
line_96	Line	Line PPAPS N 230.0 to PINPKSRP 230.0 Circuit 1
line_97	Line	Line PPAPS N 230.0 to PINPKSRP 230.0 Circuit 2
line_98	Line	Line CEDARMT2 138.0 to CEDARMT3 138.0 Circuit 1
line_99	Line	Line ADAMS 115.0 to ADAMSTAP 115.0 Circuit 1
line_100	Line	Line PRESCOTT 115.0 to BAGDTWN 115.0 Circuit 1
line_101	Line	Line SAG.EAST 115.0 to SAG.WEST 115.0 Circuit 1
line_102	Line	Line SAG.EAST 115.0 to MARANATP 115.0 Circuit 1
line_103	Line	Line SAG.EAST 115.0 to ORACLE 115.0 Circuit 1
line_104	Line	Line SAG.WEST 115.0 to SNMANUEL 115.0 Circuit 1
line_105	Line	Line SAG.WEST 115.0 to ED-5B 115.0 Circuit 1

2014 Single Contingency List (Category B)		
Contingency Number	**Type**	**Contingency Name**
line_106	Line	Line SAG.WEST 115.0 to ED-5 115.0 Circuit 1
line_107	Line	Line VLYFARMS 115.0 to ORACLE 115.0 Circuit 1
line_108	Line	Line BAGCAP 115.0 to BAGDAD 115.0 Circuit 1
line_109	Line	Line BOOTHILL 115.0 to ADAMS 115.0 Circuit 1
line_110	Line	Line BOOTHILL 115.0 to MURAL 115.0 Circuit 1
line_111	Line	Line BAGDTWN 115.0 to BAGCAP 115.0 Circuit 1
line_112	Line	Line CORONADO 500.0 to SGRLF 500.0 Circuit 1
line_113	Line	Line CORONADO 500.0 to SILVERKG 500.0 Circuit 1
line_114	Line	Line KYRENE 500.0 to BROWNING 500.0 Circuit 1
line_115	Line	Line PALOVRDE 500.0 to WESTWING 500.0 Circuit 1
line_116	Line	Line PALOVRDE 500.0 to WESTWING 500.0 Circuit 2
line_117	Line	Line PALOVRDE 500.0 to RUDD 500.0 Circuit 1
line_118	Line	Line PALOVRDE 500.0 to DEVERS 500.0 Circuit 1
line_119	Line	Line PERK PS2 500.0 to PERKINPS 500.0 Circuit 1
line_120	Line	Line PERKINPS 500.0 to WESTWING 500.0 Circuit 1
line_121	Line	Line PERKINPS 500.0 to PERK PS1 500.0 Circuit 1
line_122	Line	Line PERKINS 500.0 to PERKINPS 500.0 Circuit 1
line_123	Line	Line BROWNING 500.0 to SILVERKG 500.0 Circuit 1
line_124	Line	Line JOJOBA 500.0 to GILARIVR 500.0 Circuit 1
line_125	Line	Line JOJOBA 500.0 to GILARIVR 500.0 Circuit 2
line_126	Line	Line JOJOBA 500.0 to KYRENE 500.0 Circuit 1
line_127	Line	Line HASSYAMP 500.0 to REDHAWK 500.0 Circuit 1
line_128	Line	Line HASSYAMP 500.0 to REDHAWK 500.0 Circuit 2
line_129	Line	Line HASSYAMP 500.0 to PALOVRDE 500.0 Circuit 1
line_130	Line	Line HASSYAMP 500.0 to PALOVRDE 500.0 Circuit 2
line_131	Line	Line HASSYAMP 500.0 to PALOVRDE 500.0 Circuit 3
line_132	Line	Line PINAL_W 500.0 to DUKE 500.0 Circuit 1
line_133	Line	Line PINAL_C 500.0 to DUKE 500.0 Circuit 1
line_134	Line	Line PINAL_C 500.0 to ABEL 500.0 Circuit 1
line_135	Line	Line ABEL 500.0 to BROWNING 500.0 Circuit 1
line_136	Line	Line HASSYAMP 500.0 to PINAL_W 500.0 Circuit 1
line_137	Line	Line HASSYAMP 500.0 to JOJOBA 500.0 Circuit 1
line_138	Line	Line HASSYAMP 500.0 to ARLINTON 500.0 Circuit 1
line_139	Line	Line HASSYAMP 500.0 to HARQUAHA 500.0 Circuit 1
line_140	Line	Line HASSYAMP 500.0 to MESQUITE 500.0 Circuit 1

2014 Single Contingency List (Category B)		
Contingency Number	**Type**	**Contingency Name**
line_141	Line	Line HASSYAMP 500.0 to MESQUIT2 500.0 Circuit 1
line_142	Line	Line HASSYAMP 500.0 to HDWSH 500.0 Circuit 1
line_143	Line	Line HASSYAMP 500.0 to N.GILA 500.0 Circuit 2
line_144	Line	Line ASARCOSR 115.0 to ASARCOTP 115.0 Circuit 1
line_145	Line	Line ASARCOTP 115.0 to HAYDENAZ 115.0 Circuit 1
line_146	Line	Line ASARCOTP 115.0 to CRUSHER 115.0 Circuit 1
line_147	Line	Line BONNEYTP 115.0 to BONNYBRK 115.0 Circuit 1
line_148	Line	Line BONNEYTP 115.0 to CRUSHER 115.0 Circuit 1
line_149	Line	Line BONNEYTP 115.0 to COOLIDGE 115.0 Circuit 1
line_150	Line	Line CARLOTA 115.0 to PINTOVLY 115.0 Circuit 1
line_151	Line	Line CARLOTA 115.0 to SILVERK2 115.0 Circuit 1
line_152	Line	Line ELLISON 115.0 to ELLISOTP 115.0 Circuit 1
line_153	Line	Line FRAZIER 115.0 to HORSMESA 115.0 Circuit 1
line_154	Line	Line FRAZIER 115.0 to MOONSHI2 115.0 Circuit 1
line_155	Line	Line FRAZIER 115.0 to ROOSEVLT 115.0 Circuit 1
line_156	Line	Line GOLDFELD 115.0 to HORSMESA 115.0 Circuit 1
line_157	Line	Line HAYDENAZ 115.0 to KEARNYTP 115.0 Circuit 1
line_158	Line	Line HORSMESA 115.0 to MRMNFLAT 115.0 Circuit 1
line_159	Line	Line GASCLEAN 115.0 to ELLISOTP 115.0 Circuit 1
line_160	Line	Line KEARNYTP 115.0 to MORRISAZ 115.0 Circuit 1
line_161	Line	Line KNOLL 115.0 to MORRISAZ 115.0 Circuit 1
line_162	Line	Line MIAMI 115.0 to PINTOVLY 115.0 Circuit 1
line_163	Line	Line MIAMI 115.0 to MIAMI 3 115.0 Circuit 1
line_164	Line	Line MOONSHIN 115.0 to MOONSHI2 115.0 Circuit 1
line_165	Line	Line MOONSHIN 115.0 to PINAL 115.0 Circuit 1
line_166	Line	Line MOONSHIN 115.0 to REFINETP 115.0 Circuit 1
line_167	Line	Line OAKFLAT 115.0 to SILVERT1 115.0 Circuit 1
line_168	Line	Line OAKFLAT 115.0 to TRASK 115.0 Circuit 1
line_169	Line	Line PINAL 115.0 to SILVERT1 115.0 Circuit 1
line_170	Line	Line RAY 115.0 to KNOLL 115.0 Circuit 1
line_171	Line	Line RAY 115.0 to SUPERIOR 115.0 Circuit 1
line_172	Line	Line REFINERY 115.0 to REFINETP 115.0 Circuit 1
line_173	Line	Line SILVERK1 115.0 to SILVERT1 115.0 Circuit 1
line_174	Line	Line SILVERK2 115.0 to SUPERIOR 115.0 Circuit 1
line_175	Line	Line SPURLOCK 115.0 to SUPERIOR 115.0 Circuit 1

2014 Single Contingency List (Category B)		
Contingency Number	**Type**	**Contingency Name**
line_176	Line	Line SUPERIOR 115.0 to TRASK 115.0 Circuit 1
line_177	Line	Line CARREL 115.0 to GOLDFELD 115.0 Circuit 1
line_178	Line	Line CARREL 115.0 to SPURLOCK 115.0 Circuit 1
line_179	Line	Line REFINETP 115.0 to ELLISOTP 115.0 Circuit 1
line_180	Line	Line MIAMI 4 115.0 to ELLISOTP 115.0 Circuit 1
line_181	Line	Line MIAMI 3 115.0 to PINAL 115.0 Circuit 1
line_182	Line	Line MIAMI 3 115.0 to MIAMI 4 115.0 Circuit 1
line_183	Line	Line STWMTNTP 115.0 to MRMNFLAT 115.0 Circuit 1
line_184	Line	Line STWMTNTP 115.0 to STEWMTN 115.0 Circuit 1
line_185	Line	Line MESQUITE 230.0 to C643T 230.0 Circuit 1
line_186	Line	Line MESQUITE 230.0 to C643T 230.0 Circuit 2
line_187	Line	Line AGUAFRIA 230.0 to WESTWNGW 230.0 Circuit 1
line_188	Line	Line AGUAFRIA 230.0 to ALEXANDR 230.0 Circuit 1
line_189	Line	Line AGUAFRIA 230.0 to WHITETNK 230.0 Circuit 1
line_190	Line	Line ANDERSON 230.0 to KYR-EAST 230.0 Circuit 1
line_191	Line	Line BRANDOW 230.0 to KYR-EAST 230.0 Circuit 1
line_192	Line	Line BRANDOW 230.0 to PAPAGOBT 230.0 Circuit 1
line_193	Line	Line BRANDOW 230.0 to WARD 230.0 Circuit 2
line_194	Line	Line BRANDOW 230.0 to WARD 230.0 Circuit 4
line_195	Line	Line CORBELL 230.0 to KYR-EAST 230.0 Circuit 1
line_196	Line	Line SCHRADER 230.0 to SANTAN 230.0 Circuit 3
line_197	Line	Line SCHRADER 230.0 to SANTAN 230.0 Circuit 2
line_198	Line	Line KYR-EAST 230.0 to SCHRADER 230.0 Circuit 1
line_199	Line	Line ORME 230.0 to ANDERSON 230.0 Circuit 1
line_200	Line	Line ORME 230.0 to ANDERSON 230.0 Circuit 2
line_201	Line	Line ORME 230.0 to RUDD 230.0 Circuit 1
line_202	Line	Line ORME 230.0 to RUDD 230.0 Circuit 2
line_203	Line	Line PAPAGOBT 230.0 to KYR-EAST 230.0 Circuit 1
line_204	Line	Line PAPAGOBT 230.0 to PINPKSRP 230.0 Circuit 1
line_205	Line	Line PINPKSRP 230.0 to BRANDOW 230.0 Circuit 1
line_206	Line	Line PINPKSRP 230.0 to BRANDOW 230.0 Circuit 2
line_207	Line	Line ROGERS 230.0 to THUNDRST 230.0 Circuit 1
line_208	Line	Line ROGERS 230.0 to ROGSWAPA 230.0 Circuit 1
line_209	Line	Line ROGERS 230.0 to ROGSWAPA 230.0 Circuit 2
line_210	Line	Line SANTAN 230.0 to CORBELL 230.0 Circuit 1

2014 Single Contingency List (Category B)		
Contingency Number	**Type**	**Contingency Name**
line_211	Line	Line SANTAN 230.0 to THUNDRST 230.0 Circuit 1
line_212	Line	Line PINAL_C 230.0 to DBG 230.0 Circuit 1
line_213	Line	Line PINAL_C 230.0 to RANDOLPH 230.0 Circuit 1
line_214	Line	Line SCHRADER 230.0 to SANTAN 230.0 Circuit 1
line_215	Line	Line SILVERKG 230.0 to GOLDFELD 230.0 Circuit 1
line_216	Line	Line THUNDRST 230.0 to GOLDFELD 230.0 Circuit 1
line_217	Line	Line THUNDRST 230.0 to GOLDFELD 230.0 Circuit 2
line_218	Line	Line BROWNING 230.0 to SANTAN 230.0 Circuit 1
line_219	Line	Line BROWNING 230.0 to DINOSAUR 230.0 Circuit 1
line_220	Line	Line BROWNING 230.0 to RANDOLPH 230.0 Circuit 1
line_221	Line	Line ABEL 230.0 to DINOSAUR 230.0 Circuit 1
line_222	Line	Line ABEL 230.0 to RANDOLPH 230.0 Circuit 1
line_223	Line	Line RUDD 230.0 to WPHXAPSS 230.0 Circuit 1
line_224	Line	Line RUDD 230.0 to PLMVLY 230.0 Circuit 1
line_225	Line	Line RUDD 230.0 to WHITETNK 230.0 Circuit 1
line_226	Line	Line DBG 230.0 to CASGRAPS 230.0 Circuit 1
line_227	Line	Line ANDERSON 69.0 to RIVERSI4 69.0 Circuit 1
line_228	Line	Line ANDERSON 69.0 to ANDERSRS 69.0 Circuit 1
line_229	Line	Line BROADWA2 69.0 to BROADWA3 69.0 Circuit 1
line_230	Line	Line BROADWA2 69.0 to 15.E1.5N 69.0 Circuit 1
line_231	Line	Line BROADWA3 69.0 to BROADWA4 69.0 Circuit 1
line_232	Line	Line BROADWA3 69.0 to JEPSEN 69.0 Circuit 1
line_233	Line	Line BROADWA4 69.0 to RIVERSI2 69.0 Circuit 1
line_234	Line	Line HEARD 1 69.0 to HURLEY 4 69.0 Circuit 1
line_235	Line	Line HEARD 1 69.0 to HEARD 2 69.0 Circuit 1
line_236	Line	Line HURLEY 3 69.0 to HURLEY 4 69.0 Circuit 1
line_237	Line	Line HURLEY 3 69.0 to PARKER 69.0 Circuit 1
line_238	Line	Line RIVERSI2 69.0 to RIVERSI3 69.0 Circuit 1
line_239	Line	Line RIVERSI3 69.0 to RIVERSI4 69.0 Circuit 1
line_240	Line	Line RIVERSI3 69.0 to MCREYNO3 69.0 Circuit 1
line_241	Line	Line MICCHIP 69.0 to WILKINS1 69.0 Circuit 1
line_242	Line	Line WEILER 69.0 to 193E2.6N 69.0 Circuit 1
line_243	Line	Line WEILER 69.0 to 195E2.6N 69.0 Circuit 1
line_244	Line	Line WILKINS1 69.0 to WILKINTP 69.0 Circuit 1
line_245	Line	Line WILKINS1 69.0 to 195E0.5N 69.0 Circuit 1

2014 Single Contingency List (Category B)		
Contingency Number	**Type**	**Contingency Name**
line_246	Line	Line WILKINS2 69.0 to WILKINTP 69.0 Circuit 1
line_247	Line	Line WILKINS3 69.0 to WILKINS4 69.0 Circuit 1
line_248	Line	Line WILKINS3 69.0 to WILKINTP 69.0 Circuit 1
line_249	Line	Line SINNOTT 69.0 to IRVIN 69.0 Circuit 1
line_250	Line	Line DORMAN 69.0 to MARLEY 69.0 Circuit 1
line_251	Line	Line DORMAN 69.0 to KNOX 69.0 Circuit 1
line_252	Line	Line WILKINS4 69.0 to WILKINTP 69.0 Circuit 1
line_253	Line	Line HURLEY 1 69.0 to JEPSEN 69.0 Circuit 1
line_254	Line	Line HURLEY 1 69.0 to HURLEY 2 69.0 Circuit 1
line_255	Line	Line HURLEY 2 69.0 to HURLEY 3 69.0 Circuit 1
line_256	Line	Line PARKER 69.0 to 15.E1.5N 69.0 Circuit 1
line_257	Line	Line BARTLETT 69.0 to FOOTHILL 69.0 Circuit 1
line_258	Line	Line BARTLETT 69.0 to WILKINS4 69.0 Circuit 1
line_259	Line	Line MARCOS 3 69.0 to MARCOS 4 69.0 Circuit 1
line_260	Line	Line MARCOS 2 69.0 to MARCOS 3 69.0 Circuit 1
line_261	Line	Line MARCOS 2 69.0 to 22.E1.0N 69.0 Circuit 1
line_262	Line	Line SAYLOR 3 69.0 to SAYLOR 2 69.0 Circuit 1
line_263	Line	Line AHWA 1 69.0 to SAYLOR 3 69.0 Circuit 1
line_264	Line	Line AHWA 1 69.0 to AHWA 2 69.0 Circuit 1
line_265	Line	Line BIGSPINN 69.0 to ROE 4 69.0 Circuit 1
line_266	Line	Line BIGSPINN 69.0 to 21.E1.8S 69.0 Circuit 1
line_267	Line	Line CLEMANS1 69.0 to CLEMANS2 69.0 Circuit 1
line_268	Line	Line CLEMANS1 69.0 to 252E1.5S 69.0 Circuit 1
line_269	Line	Line CLEMANS2 69.0 to CLEMANS3 69.0 Circuit 1
line_270	Line	Line CLEMANS2 69.0 to OMEGA 69.0 Circuit 1
line_271	Line	Line CLEMANS3 69.0 to 237E2.0S 69.0 Circuit 1
line_272	Line	Line DISPLAY 69.0 to 237E2.0S 69.0 Circuit 1
line_273	Line	Line FOUNDRY 69.0 to 214E0.5S 69.0 Circuit 1
line_274	Line	Line HIGHLINE 69.0 to 237E2.0S 69.0 Circuit 1
line_275	Line	Line HIGHLINE 69.0 to 22.E2.0S 69.0 Circuit 1
line_276	Line	Line LASSEN 3 69.0 to 195E0.5N 69.0 Circuit 1
line_277	Line	Line MARCOS 4 69.0 to 217E1.5S 69.0 Circuit 1
line_278	Line	Line OWENS 3 69.0 to OWENS 2 69.0 Circuit 1
line_279	Line	Line LASSEN 2 69.0 to LASSEN 3 69.0 Circuit 1
line_280	Line	Line LASSEN 2 69.0 to LASSEN 1 69.0 Circuit 1

2014 Single Contingency List (Category B)		
Contingency Number	**Type**	**Contingency Name**
line_281	Line	Line LASSEN 1 69.0 to 214E0.5S 69.0 Circuit 1
line_282	Line	Line OWENS 4 69.0 to OWENS 3 69.0 Circuit 1
line_283	Line	Line GILA 2 69.0 to GILA 3 69.0 Circuit 1
line_284	Line	Line GILA 2 69.0 to STELLAR 69.0 Circuit 1
line_285	Line	Line GILA 3 69.0 to GILA 4 69.0 Circuit 1
line_286	Line	Line GILA 3 69.0 to 23.E6.0S 69.0 Circuit 1
line_287	Line	Line GILA 4 69.0 to KNOX 69.0 Circuit 1
line_288	Line	Line ROE 1 69.0 to ROE 2 69.0 Circuit 1
line_289	Line	Line ROE 2 69.0 to ROE 3 69.0 Circuit 1
line_290	Line	Line ROE 2 69.0 to WINSOR 69.0 Circuit 1
line_291	Line	Line ROE 3 69.0 to ROE 4 69.0 Circuit 1
line_292	Line	Line RUPPERS 69.0 to WINSOR 69.0 Circuit 1
line_293	Line	Line RUPPERS 69.0 to MARLEY 69.0 Circuit 1
line_294	Line	Line SAYLOR 1 69.0 to SAYLOR 2 69.0 Circuit 1
line_295	Line	Line SAYLOR 1 69.0 to 20.E1.0S 69.0 Circuit 1
line_296	Line	Line HEARD 2 69.0 to HEARD 3 69.0 Circuit 1
line_297	Line	Line HEARD 3 69.0 to HEARD 4 69.0 Circuit 1
line_298	Line	Line HEARD 4 69.0 to 193E2.6N 69.0 Circuit 1
line_299	Line	Line COOK 1 69.0 to COOK 2 69.0 Circuit 1
line_300	Line	Line COOK 1 69.0 to HARMON 69.0 Circuit 1
line_301	Line	Line COOK 2 69.0 to COOK 3 69.0 Circuit 1
line_302	Line	Line COOK 2 69.0 to CORTEZ 2 69.0 Circuit 1
line_303	Line	Line COOK 3 69.0 to SANDERSO 69.0 Circuit 1
line_304	Line	Line GAUCHO 1 69.0 to OLIVE 69.0 Circuit 1
line_305	Line	Line GAUCHO 1 69.0 to GAUCHO 2 69.0 Circuit 1
line_306	Line	Line GLENN 69.0 to 5.5E9.0N 69.0 Circuit 1
line_307	Line	Line MARYVAL1 69.0 to MARYVAL3 69.0 Circuit 1
line_308	Line	Line MARYVAL3 69.0 to MARYVAL4 69.0 Circuit 1
line_309	Line	Line MARYVAL3 69.0 to 7.5E9.0N 69.0 Circuit 1
line_310	Line	Line MARYVAL4 69.0 to VALENCI3 69.0 Circuit 1
line_311	Line	Line NORTHER1 69.0 to NORTHER2 69.0 Circuit 1
line_312	Line	Line NORTHER2 69.0 to NORTHER3 69.0 Circuit 1
line_313	Line	Line NORTHER3 69.0 to NORTHER4 69.0 Circuit 1
line_314	Line	Line NORTHER4 69.0 to 9.5E13.N 69.0 Circuit 1
line_315	Line	Line WASSER 69.0 to MOORE 69.0 Circuit 1

2014 Single Contingency List (Category B)		
Contingency Number	**Type**	**Contingency Name**
line_316	Line	Line WASSER 69.0 to SANDERSO 69.0 Circuit 1
line_317	Line	Line AHWA 2 69.0 to AHWA 3 69.0 Circuit 1
line_318	Line	Line AHWA 3 69.0 to AHWA 4 69.0 Circuit 1
line_319	Line	Line AHWA 4 69.0 to ROE 1 69.0 Circuit 1
line_320	Line	Line ALHAMBR1 69.0 to ALHAMBR2 69.0 Circuit 1
line_321	Line	Line ALHAMBR2 69.0 to BARCELON 69.0 Circuit 1
line_322	Line	Line ALHAMBR2 69.0 to ALHAMBR3 69.0 Circuit 1
line_323	Line	Line ALHAMBR3 69.0 to ALHAMBR4 69.0 Circuit 1
line_324	Line	Line ALHAMBR3 69.0 to WESTWOO4 69.0 Circuit 1
line_325	Line	Line ALHAMBR4 69.0 to ALEXANDR 69.0 Circuit 1
line_326	Line	Line ALTAVIS1 69.0 to ALTAVIS2 69.0 Circuit 1
line_327	Line	Line ALTAVIS2 69.0 to ALTAVIS3 69.0 Circuit 1
line_328	Line	Line ALTAVIS3 69.0 to NORTHER3 69.0 Circuit 1
line_329	Line	Line CORTEZ 1 69.0 to CORTEZ 2 69.0 Circuit 1
line_330	Line	Line CORTEZ 1 69.0 to PRINGLE 69.0 Circuit 1
line_331	Line	Line CORTEZ 2 69.0 to CORTEZ 3 69.0 Circuit 1
line_332	Line	Line CORTEZ 3 69.0 to 9.5E13.N 69.0 Circuit 1
line_333	Line	Line MARLETT1 69.0 to MARLETT2 69.0 Circuit 1
line_334	Line	Line MARLETT1 69.0 to ALEXANDR 69.0 Circuit 1
line_335	Line	Line MARLETT2 69.0 to ALTAVIS1 69.0 Circuit 1
line_336	Line	Line MARLETT2 69.0 to MARLETT3 69.0 Circuit 1
line_337	Line	Line MARLETT3 69.0 to MARLETT4 69.0 Circuit 1
line_338	Line	Line MARLETT4 69.0 to WESTWOO3 69.0 Circuit 1
line_339	Line	Line VALENCI2 69.0 to VALENCI3 69.0 Circuit 1
line_340	Line	Line VALENCI3 69.0 to VALENCI4 69.0 Circuit 1
line_341	Line	Line VALENCI4 69.0 to 8.5E7.5N 69.0 Circuit 1
line_342	Line	Line WESTWOO1 69.0 to VALENCI2 69.0 Circuit 1
line_343	Line	Line WESTWOO1 69.0 to WESTWOO2 69.0 Circuit 1
line_344	Line	Line WESTWOO2 69.0 to WESTWOO3 69.0 Circuit 1
line_345	Line	Line WESTWOO3 69.0 to WESTWOO4 69.0 Circuit 1
line_346	Line	Line PRINGLE 69.0 to ALEXANDR 69.0 Circuit 1
line_347	Line	Line 196E2.5N 69.0 to 195E2.6N 69.0 Circuit 1
line_348	Line	Line 20.E2.7N 69.0 to 196E2.5N 69.0 Circuit 1
line_349	Line	Line 20.E2.7N 69.0 to 204E4.0N 69.0 Circuit 1
line_350	Line	Line BEELINE1 69.0 to BEELINE2 69.0 Circuit 1

2014 Single Contingency List (Category B)		
Contingency Number	**Type**	**Contingency Name**
line_351	Line	Line BEELINE1 69.0 to BRANDOW 69.0 Circuit 1
line_352	Line	Line BEELINE2 69.0 to BEELINE3 69.0 Circuit 1
line_353	Line	Line BEELINE3 69.0 to BEELINE4 69.0 Circuit 1
line_354	Line	Line BEELINE3 69.0 to INDIANB3 69.0 Circuit 1
line_355	Line	Line BEELINE4 69.0 to 195E6.9N 69.0 Circuit 1
line_356	Line	Line CHAMBERS 69.0 to NOBLE 69.0 Circuit 1
line_357	Line	Line CHAMBERS 69.0 to PIMASRP2 69.0 Circuit 1
line_358	Line	Line FLUME 69.0 to STADIUM 69.0 Circuit 1
line_359	Line	Line FLUME 69.0 to 211E4.8N 69.0 Circuit 1
line_360	Line	Line INDIANB1 69.0 to CHAPARRA 69.0 Circuit 1
line_361	Line	Line INDIANB1 69.0 to INDIANB2 69.0 Circuit 1
line_362	Line	Line INDIANB2 69.0 to 22.4E9N 69.0 Circuit 1
line_363	Line	Line INDIANB2 69.0 to INDIANB3 69.0 Circuit 1
line_364	Line	Line PICO 69.0 to TOVREA 69.0 Circuit 1
line_365	Line	Line PICO 69.0 to 195E6.9N 69.0 Circuit 1
line_366	Line	Line PIMASRP2 69.0 to PIMASRP3 69.0 Circuit 1
line_367	Line	Line PIMASRP3 69.0 to CHAPARRA 69.0 Circuit 1
line_368	Line	Line PIMASRP3 69.0 to PIMASRP4 69.0 Circuit 1
line_369	Line	Line TOVREA 69.0 to 211E4.8N 69.0 Circuit 1
line_370	Line	Line ARCADIA1 69.0 to ARCADIA2 69.0 Circuit 1
line_371	Line	Line ARCADIA2 69.0 to ARCADIA3 69.0 Circuit 1
line_372	Line	Line ARCADIA2 69.0 to FALLS 69.0 Circuit 1
line_373	Line	Line ARCADIA3 69.0 to SQUAWPEA 69.0 Circuit 1
line_374	Line	Line ARIZONA2 69.0 to ARIZONA3 69.0 Circuit 1
line_375	Line	Line ARIZONA2 69.0 to INGLESI2 69.0 Circuit 1
line_376	Line	Line ARIZONA3 69.0 to PAPAGOBT 69.0 Circuit 1
line_377	Line	Line ARIZONA3 69.0 to 195E6.9N 69.0 Circuit 1
line_378	Line	Line CEDRSTR1 69.0 to INGLESI1 69.0 Circuit 1
line_379	Line	Line CEDRSTR1 69.0 to CEDRSTR2 69.0 Circuit 1
line_380	Line	Line CROSSCUT 69.0 to 211E4.7N 69.0 Circuit 1
line_381	Line	Line CROSSCUT 69.0 to 20.E4.2N 69.0 Circuit 1
line_382	Line	Line CROSSHYD 69.0 to CROSSCUT 69.0 Circuit 1
line_383	Line	Line FALLS 69.0 to PAPAGOBT 69.0 Circuit 1
line_384	Line	Line INGLESI1 69.0 to INGLESI2 69.0 Circuit 1
line_385	Line	Line INGLESI2 69.0 to INGLESI3 69.0 Circuit 1

2014 Single Contingency List (Category B)		
Contingency Number	**Type**	**Contingency Name**
line_386	Line	Line INGLESI3 69.0 to OSBORN 1 69.0 Circuit 1
line_387	Line	Line MADISON 69.0 to SPARTAN 69.0 Circuit 1
line_388	Line	Line MADISON 69.0 to SQUAWTAP 69.0 Circuit 1
line_389	Line	Line OSBORN 1 69.0 to OSBORN 2 69.0 Circuit 1
line_390	Line	Line OSBORN 2 69.0 to OSBORN 3 69.0 Circuit 1
line_391	Line	Line OSBORN 2 69.0 to TAVAN 69.0 Circuit 1
line_392	Line	Line OSBORN 3 69.0 to SPARTAN 69.0 Circuit 1
line_393	Line	Line PERA 69.0 to 21E7.24N 69.0 Circuit 1
line_394	Line	Line PERA 69.0 to 211E4.7N 69.0 Circuit 1
line_395	Line	Line SCOTTSDA 69.0 to 22.4E9N 69.0 Circuit 1
line_396	Line	Line SCOTTSDA 69.0 to 21E7.25N 69.0 Circuit 1
line_397	Line	Line SQUAWPEA 69.0 to SQUAWTAP 69.0 Circuit 1
line_398	Line	Line ALAMEDA1 69.0 to ALAMEDA2 69.0 Circuit 1
line_399	Line	Line ALAMEDA1 69.0 to WARD RS 69.0 Circuit 1
line_400	Line	Line ALAMEDA2 69.0 to ALAMEDA3 69.0 Circuit 1
line_401	Line	Line ALAMEDA3 69.0 to 22.E1.0N 69.0 Circuit 1
line_402	Line	Line ALAMEDA4 69.0 to ALAMEDA3 69.0 Circuit 1
line_403	Line	Line ALAMEDA4 69.0 to DOBSON 2 69.0 Circuit 1
line_404	Line	Line BINARY 69.0 to 196E2.5N 69.0 Circuit 1
line_405	Line	Line DOBSON 1 69.0 to DOBSON 2 69.0 Circuit 1
line_406	Line	Line DOBSON 2 69.0 to DOBSON 3 69.0 Circuit 1
line_407	Line	Line DOBSON 3 69.0 to DOBSON 4 69.0 Circuit 1
line_408	Line	Line DOBSON 4 69.0 to WARD RS 69.0 Circuit 1
line_409	Line	Line HOKAM 1 69.0 to MICRO 1 69.0 Circuit 1
line_410	Line	Line HOKAM 1 69.0 to HOKAM 2 69.0 Circuit 1
line_411	Line	Line MICRO 1 69.0 to MICRO 2 69.0 Circuit 1
line_412	Line	Line MICRO 2 69.0 to MICRO 3 69.0 Circuit 1
line_413	Line	Line MICRO 2 69.0 to 25.E3.0N 69.0 Circuit 1
line_414	Line	Line MICRO 3 69.0 to TEMPESRP 69.0 Circuit 1
line_415	Line	Line PICKREL2 69.0 to 20.E2.7N 69.0 Circuit 1
line_416	Line	Line PICKREL2 69.0 to PICKREL3 69.0 Circuit 1
line_417	Line	Line TEMPESRP 69.0 to 247E3.0N 69.0 Circuit 1
line_418	Line	Line UNIVERSI 69.0 to 257E3.0N 69.0 Circuit 1
line_419	Line	Line UNIVERSI 69.0 to 25.E3.0N 69.0 Circuit 1
line_420	Line	Line WARD RS 69.0 to 247E3.0N 69.0 Circuit 1

2014 Single Contingency List (Category B)		
Contingency Number	**Type**	**Contingency Name**
line_421	Line	Line WER MUS 69.0 to 195E2.6N 69.0 Circuit 1
line_422	Line	Line PENDERGS 69.0 to TOLBY 69.0 Circuit 1
line_423	Line	Line PENDERGS 69.0 to ROVEY 69.0 Circuit 1
line_424	Line	Line BROOKS 69.0 to SEARGANT 69.0 Circuit 1
line_425	Line	Line CARTWRI2 69.0 to CARTWRI3 69.0 Circuit 1
line_426	Line	Line CARTWRI2 69.0 to 8.4E7.5N 69.0 Circuit 1
line_427	Line	Line CARTWRI3 69.0 to CARTWRI4 69.0 Circuit 1
line_428	Line	Line CARTWRI3 69.0 to 8.0E7.5N 69.0 Circuit 1
line_429	Line	Line CARTWRI4 69.0 to ISAAC 69.0 Circuit 1
line_430	Line	Line CHRISTY 69.0 to ORME RS 69.0 Circuit 1
line_431	Line	Line CHRISTY 69.0 to 8.4E7.5N 69.0 Circuit 1
line_432	Line	Line EVANS 69.0 to SHEELY 69.0 Circuit 1
line_433	Line	Line EVANS 69.0 to ORME RS 69.0 Circuit 1
line_434	Line	Line ISAAC 69.0 to 9.0E3.0N 69.0 Circuit 1
line_435	Line	Line KAY 69.0 to ORME RS 69.0 Circuit 1
line_436	Line	Line KAY 69.0 to 9.0E3.0N 69.0 Circuit 1
line_437	Line	Line SHAW 69.0 to 8.0E7.5N 69.0 Circuit 1
line_438	Line	Line SHEELY 69.0 to 5.5E8.5N 69.0 Circuit 1
line_439	Line	Line SOUTHERN 69.0 to 8.5E1.0N 69.0 Circuit 1
line_440	Line	Line SOUTHERN 69.0 to MCREYNO1 69.0 Circuit 1
line_441	Line	Line TRESRIOS 69.0 to STOKER 69.0 Circuit 1
line_442	Line	Line UNIFIED 69.0 to 4.0E1.0N 69.0 Circuit 1
line_443	Line	Line CHEATHAM 69.0 to IRVIN 69.0 Circuit 1
line_444	Line	Line CHEATHAM 69.0 to 7.0E1.0N 69.0 Circuit 1
line_445	Line	Line COWDEN 69.0 to 1.0E3.9N 69.0 Circuit 1
line_446	Line	Line BURTON 69.0 to COWDEN 69.0 Circuit 1
line_447	Line	Line BURTON 69.0 to STOKER 69.0 Circuit 1
line_448	Line	Line HANSON 69.0 to 1.0E3.9N 69.0 Circuit 1
line_449	Line	Line HANSON 69.0 to WHITETNK 69.0 Circuit 1
line_450	Line	Line CASHION2 69.0 to OPPORTUN 69.0 Circuit 1
line_451	Line	Line CASHION2 69.0 to CASHION3 69.0 Circuit 1
line_452	Line	Line CASHION3 69.0 to CASHION4 69.0 Circuit 1
line_453	Line	Line CASHION4 69.0 to 1.0E3.9N 69.0 Circuit 1
line_454	Line	Line CASHION4 69.0 to CASHION5 69.0 Circuit 1
line_455	Line	Line CASHION5 69.0 to 2.2E4.0N 69.0 Circuit 1

2014 Single Contingency List (Category B)		
Contingency Number	**Type**	**Contingency Name**
line_456	Line	Line COLLIER 69.0 to OPPORTUN 69.0 Circuit 1
line_457	Line	Line CONOVALO 69.0 to BROOKS 69.0 Circuit 1
line_458	Line	Line CONOVALO 69.0 to SUNSET 3 69.0 Circuit 1
line_459	Line	Line GRASMOE1 69.0 to GRASMOE2 69.0 Circuit 1
line_460	Line	Line GRASMOE1 69.0 to WELBORN2 69.0 Circuit 1
line_461	Line	Line GRASMOE2 69.0 to GRASMOE3 69.0 Circuit 1
line_462	Line	Line GRASMOE2 69.0 to SUNSET 4 69.0 Circuit 1
line_463	Line	Line GRASMOE3 69.0 to 5.5E8.5N 69.0 Circuit 1
line_464	Line	Line STOKER 69.0 to 2.2E4.0N 69.0 Circuit 1
line_465	Line	Line SUNSET 2 69.0 to SUNSET 3 69.0 Circuit 1
line_466	Line	Line SUNSET 2 69.0 to WHITETNK 69.0 Circuit 1
line_467	Line	Line SUNSET 3 69.0 to SUNSET 4 69.0 Circuit 1
line_468	Line	Line TOLBY 69.0 to WHITETNK 69.0 Circuit 1
line_469	Line	Line WELBORN3 69.0 to WELBORN2 69.0 Circuit 1
line_470	Line	Line W.CONTN 69.0 to 2.2E4.0N 69.0 Circuit 1
line_471	Line	Line MONUMENT 69.0 to TRESRIOS 69.0 Circuit 1
line_472	Line	Line MONUMENT 69.0 to UNIFIED 69.0 Circuit 1
line_473	Line	Line ROVEY 69.0 to WELBORN3 69.0 Circuit 1
line_474	Line	Line BASELIN1 69.0 to BASELIN2 69.0 Circuit 1
line_475	Line	Line BASELIN1 69.0 to GREER 69.0 Circuit 1
line_476	Line	Line BASELIN2 69.0 to BASELIN3 69.0 Circuit 1
line_477	Line	Line BASELIN3 69.0 to BASELIN4 69.0 Circuit 1
line_478	Line	Line BASELIN3 69.0 to 36.E1.0N 69.0 Circuit 1
line_479	Line	Line BASELIN3 69.0 to 358E1.0S 69.0 Circuit 1
line_480	Line	Line CITRUS 0 69.0 to CITRUS 2 69.0 Circuit 1
line_481	Line	Line CITRUS 0 69.0 to HUNT 69.0 Circuit 1
line_482	Line	Line CITRUS 2 69.0 to CITRUS 3 69.0 Circuit 1
line_483	Line	Line CITRUS 3 69.0 to CITRUS 4 69.0 Circuit 1
line_484	Line	Line CITRUS 3 69.0 to WORTMAN 69.0 Circuit 1
line_485	Line	Line CITRUS 4 69.0 to HUMPHREY 69.0 Circuit 1
line_486	Line	Line COOPER 69.0 to TURPEN 69.0 Circuit 1
line_487	Line	Line CRISMON 69.0 to GERMANN 69.0 Circuit 1
line_488	Line	Line GERMANN 69.0 to MICROMIL 69.0 Circuit 1
line_489	Line	Line MOODY 1 69.0 to MOODY 2 69.0 Circuit 1
line_490	Line	Line MOODY 1 69.0 to CLARK 69.0 Circuit 1

2014 Single Contingency List (Category B)		
Contingency Number	**Type**	**Contingency Name**
line_491	Line	Line MOODY 2 69.0 to MOODY 3 69.0 Circuit 1
line_492	Line	Line MOODY 2 69.0 to BOGLE 69.0 Circuit 1
line_493	Line	Line MOODY 3 69.0 to MOODY 4 69.0 Circuit 1
line_494	Line	Line MOODY 3 69.0 to ROHRIG 69.0 Circuit 1
line_495	Line	Line MOODY 4 69.0 to 36.E5.3S 69.0 Circuit 1
line_496	Line	Line KEMPTON1 69.0 to KEMPTON2 69.0 Circuit 1
line_497	Line	Line KEMPTON2 69.0 to KEMPTON3 69.0 Circuit 1
line_498	Line	Line KEMPTON2 69.0 to 295E1.0S 69.0 Circuit 1
line_499	Line	Line KEMPTON3 69.0 to KEMPTON4 69.0 Circuit 1
line_500	Line	Line KEMPTON4 69.0 to LACY 69.0 Circuit 1
line_501	Line	Line LACY 69.0 to SANTAN 69.0 Circuit 1
line_502	Line	Line NEELY 69.0 to 28.E4.0S 69.0 Circuit 1
line_503	Line	Line NEELY 69.0 to 29.E2.0S 69.0 Circuit 1
line_504	Line	Line QUAIL 1 69.0 to QUAIL 2 69.0 Circuit 1
line_505	Line	Line QUAIL 1 69.0 to ABEL 69.0 Circuit 1
line_506	Line	Line QUAIL 2 69.0 to QUAIL 3 69.0 Circuit 1
line_507	Line	Line QUAIL 3 69.0 to QUAIL 4 69.0 Circuit 1
line_508	Line	Line QUEENCRE 69.0 to 42.E9.0S 69.0 Circuit 1
line_509	Line	Line RITTENHO 69.0 to 41.E9.0S 69.0 Circuit 1
line_510	Line	Line RITTENHO 69.0 to ROHRIG 69.0 Circuit 1
line_511	Line	Line WORTMAN 69.0 to GREENFLD 69.0 Circuit 1
line_512	Line	Line SHULTZ 1 69.0 to SHULTZ 2 69.0 Circuit 1
line_513	Line	Line SHULTZ 1 69.0 to 28.E5.2S 69.0 Circuit 1
line_514	Line	Line SHULTZ 2 69.0 to SHULTZ 3 69.0 Circuit 1
line_515	Line	Line SHULTZ 3 69.0 to SHULTZ 4 69.0 Circuit 1
line_516	Line	Line TENNEY 69.0 to SHULTZ 4 69.0 Circuit 1
line_517	Line	Line WILLIAMS 69.0 to 36.E5.3S 69.0 Circuit 1
line_518	Line	Line AF-NORTH 69.0 to HARMON 69.0 Circuit 1
line_519	Line	Line AF-NORTH 69.0 to NORTHER2 69.0 Circuit 1
line_520	Line	Line AF-NORTH 69.0 to OLIVE 69.0 Circuit 1
line_521	Line	Line AF-STEAM 69.0 to BARCELON 69.0 Circuit 1
line_522	Line	Line AF-STEAM 69.0 to GLENN 69.0 Circuit 1
line_523	Line	Line AF-STEAM 69.0 to MARYVAL1 69.0 Circuit 1
line_524	Line	Line AF-STEAM 69.0 to MOORE 69.0 Circuit 1
line_525	Line	Line AF-STEAM 69.0 to AF-NORTH 69.0 Circuit 1

2014 Single Contingency List (Category B)		
Contingency Number	**Type**	**Contingency Name**
line_526	Line	Line AF-STEAM 69.0 to AF-NORTH 69.0 Circuit 2
line_527	Line	Line KYRENEGT 69.0 to OWENS 4 69.0 Circuit 1
line_528	Line	Line KYRENEGT 69.0 to 214E0.5S 69.0 Circuit 1
line_529	Line	Line KYRENEGT 69.0 to KYRENEST 69.0 Circuit 1
line_530	Line	Line KYRENEGT 69.0 to 21.E1.0S 69.0 Circuit 1
line_531	Line	Line KYRENEGT 69.0 to 21.E1.8S 69.0 Circuit 1
line_532	Line	Line KYRENEGT 69.0 to 22.E2.0S 69.0 Circuit 1
line_533	Line	Line KYRENEGT 69.0 to 217E1.5S 69.0 Circuit 1
line_534	Line	Line SANTAN 69.0 to GREENFLD 69.0 Circuit 1
line_535	Line	Line SANTAN 69.0 to TENNEY 69.0 Circuit 1
line_536	Line	Line SANTAN 69.0 to FREESTON 69.0 Circuit 1
line_537	Line	Line SANTAN 69.0 to ZIMMERMN 69.0 Circuit 1
line_538	Line	Line SANTAN 69.0 to GREER 69.0 Circuit 1
line_539	Line	Line ANDERSRS 69.0 to FOOTHILL 69.0 Circuit 1
line_540	Line	Line ANDERSRS 69.0 to SINNOTT 69.0 Circuit 1
line_541	Line	Line ANDERSRS 69.0 to 15.E1.5N 69.0 Circuit 1
line_542	Line	Line ANDERSRS 69.0 to MCREYNO2 69.0 Circuit 1
line_543	Line	Line SCHRADER 69.0 to DELTA 3 69.0 Circuit 1
line_544	Line	Line SCHRADER 69.0 to SANCARL2 69.0 Circuit 1
line_545	Line	Line SCHRADER 69.0 to FERRIS 69.0 Circuit 1
line_546	Line	Line BRANDOW 69.0 to 204E4.0N 69.0 Circuit 1
line_547	Line	Line BRANDOW 69.0 to NOBLE 69.0 Circuit 1
line_548	Line	Line BRANDOW 69.0 to STADIUM 69.0 Circuit 1
line_549	Line	Line BRANDOW 69.0 to WARD RS 69.0 Circuit 1
line_550	Line	Line BRANDOW 69.0 to WARD RS 69.0 Circuit 2
line_551	Line	Line CORBELRS 69.0 to CORBELL 69.0 Circuit 1
line_552	Line	Line CORBELRS 69.0 to MANOR 69.0 Circuit 1
line_553	Line	Line CORBELRS 69.0 to 252E1.5S 69.0 Circuit 1
line_554	Line	Line CORBELRS 69.0 to WOOD 2 69.0 Circuit 1
line_555	Line	Line CORBELRS 69.0 to WOOD 3 69.0 Circuit 1
line_556	Line	Line CORBELRS 69.0 to 28.E2.0S 69.0 Circuit 1
line_557	Line	Line CORBELRS 69.0 to 28.E1.5S 69.0 Circuit 1
line_558	Line	Line ORME RS 69.0 to SHAW 69.0 Circuit 1
line_559	Line	Line ORME RS 69.0 to 4.0E1.0N 69.0 Circuit 1
line_560	Line	Line ORME RS 69.0 to SEARGANT 69.0 Circuit 1

2014 Single Contingency List (Category B)		
Contingency Number	**Type**	**Contingency Name**
line_561	Line	Line PAPAGOBT 69.0 to 21E7.24N 69.0 Circuit 1
line_562	Line	Line PAPAGOBT 69.0 to 21E7.25N 69.0 Circuit 1
line_563	Line	Line PAPAGOBT 69.0 to ARCADIA1 69.0 Circuit 1
line_564	Line	Line PAPAGOBT 69.0 to TAVAN 69.0 Circuit 1
line_565	Line	Line ROGERS 69.0 to 275E4.0N 69.0 Circuit 1
line_566	Line	Line ROGERS 69.0 to RICE 4 69.0 Circuit 1
line_567	Line	Line ROGERS 69.0 to STAPLEY3 69.0 Circuit 1
line_568	Line	Line ROGERS 69.0 to LEHI 1 69.0 Circuit 1
line_569	Line	Line ROGERS 69.0 to 265E3.0N 69.0 Circuit 1
line_570	Line	Line THUNDRST 69.0 to 37.E118N 69.0 Circuit 1
line_571	Line	Line THUNDRST 69.0 to SALTGILA 69.0 Circuit 1
line_572	Line	Line THUNDRST 69.0 to SGNLBUT1 69.0 Circuit 1
line_573	Line	Line WARD 69.0 to WARD RS 69.0 Circuit 1
line_574	Line	Line WARD 69.0 to 257E3.0N 69.0 Circuit 1
line_575	Line	Line WHITETNK 69.0 to COLLIER 69.0 Circuit 1
line_576	Line	Line KNOX 69.0 to ROE 3 69.0 Circuit 1
line_577	Line	Line OWENS 2 69.0 to STELLAR 69.0 Circuit 1
line_578	Line	Line CASEY 69.0 to 35.E3.0S 69.0 Circuit 1
line_579	Line	Line FREESTON 69.0 to TURPEN 69.0 Circuit 1
line_580	Line	Line ZIMMERMN 69.0 to KEMPTON1 69.0 Circuit 1
line_581	Line	Line 41.E9.0S 69.0 to 42.E9.0S 69.0 Circuit 1
line_582	Line	Line WATKINS 69.0 to 436E15.S 69.0 Circuit 1
line_583	Line	Line FLORENCE 69.0 to QUAIL 3 69.0 Circuit 1
line_584	Line	Line POTTER 69.0 to BASELIN4 69.0 Circuit 1
line_585	Line	Line POTTER 69.0 to BROWNING 69.0 Circuit 1
line_586	Line	Line COOLEY 69.0 to SANTAN 69.0 Circuit 1
line_587	Line	Line COOLEY 69.0 to CASEY 69.0 Circuit 1
line_588	Line	Line COOLEY 69.0 to 35.E3.0S 69.0 Circuit 1
line_589	Line	Line COOLEY 69.0 to 36.E5.3S 69.0 Circuit 1
line_590	Line	Line BOGLE 69.0 to RITTENHO 69.0 Circuit 1
line_591	Line	Line HUMPHREY 69.0 to SANCARL4 69.0 Circuit 1
line_592	Line	Line 274E5.2S 69.0 to SHULTZ 3 69.0 Circuit 1
line_593	Line	Line TWEEDY 69.0 to SCHRADER 69.0 Circuit 1
line_594	Line	Line 23.E6.0S 69.0 to 244E6.0S 69.0 Circuit 1
line_595	Line	Line DELTA 3 69.0 to DELTA 4 69.0 Circuit 1

2014 Single Contingency List (Category B)		
Contingency Number	**Type**	**Contingency Name**
line_596	Line	Line DELTA 4 69.0 to DELTA 5 69.0 Circuit 1
line_597	Line	Line DELTA 4 69.0 to JONES 69.0 Circuit 1
line_598	Line	Line ROTH 69.0 to DELTA 5 69.0 Circuit 1
line_599	Line	Line ROTH 69.0 to SYNERGY 69.0 Circuit 1
line_600	Line	Line SANCARL1 69.0 to COOPER 69.0 Circuit 1
line_601	Line	Line SANCARL1 69.0 to SANCARL2 69.0 Circuit 1
line_602	Line	Line SANCARL2 69.0 to SANCARL3 69.0 Circuit 1
line_603	Line	Line SANCARL3 69.0 to SANCARL4 69.0 Circuit 1
line_604	Line	Line LUNA 69.0 to MCPHERSO 69.0 Circuit 1
line_605	Line	Line SUNLAKES 69.0 to SCHRADER 69.0 Circuit 1
line_606	Line	Line SUNLAKES 69.0 to HOOPES 69.0 Circuit 1
line_607	Line	Line WILLIS 69.0 to SANCARL3 69.0 Circuit 1
line_608	Line	Line HOOPES 69.0 to SCHRADER 69.0 Circuit 1
line_609	Line	Line HOOPES 69.0 to SYNERGY 69.0 Circuit 1
line_610	Line	Line HOOPES 69.0 to SYNERGY 69.0 Circuit 2
line_611	Line	Line PACE 69.0 to SCHRADER 69.0 Circuit 1
line_612	Line	Line PACE 69.0 to WILLIS 69.0 Circuit 1
line_613	Line	Line AMERICA 69.0 to CENTENNI 69.0 Circuit 1
line_614	Line	Line 23.E5.4S 69.0 to 23.E6.0S 69.0 Circuit 1
line_615	Line	Line 247E5.2S 69.0 to JONES 69.0 Circuit 1
line_616	Line	Line 247E5.2S 69.0 to 245E6.0S 69.0 Circuit 1
line_617	Line	Line 244E6.0S 69.0 to 245E6.0S 69.0 Circuit 1
line_618	Line	Line AIRPARK 69.0 to 23.E5.4S 69.0 Circuit 1
line_619	Line	Line CORBELL 69.0 to GRISWOLD 69.0 Circuit 1
line_620	Line	Line HANGER 1 69.0 to HANGER 2 69.0 Circuit 1
line_621	Line	Line HANGER 1 69.0 to HOUSTON 69.0 Circuit 1
line_622	Line	Line HANGER 2 69.0 to HANGER 3 69.0 Circuit 1
line_623	Line	Line HANGER 2 69.0 to 252E1.5S 69.0 Circuit 1
line_624	Line	Line HANGER 3 69.0 to HANGER 4 69.0 Circuit 1
line_625	Line	Line HANGER 4 69.0 to GRISWOLD 69.0 Circuit 1
line_626	Line	Line HOUSTON 69.0 to 25.E3.4S 69.0 Circuit 1
line_627	Line	Line LINOX 69.0 to CENTENNI 69.0 Circuit 1
line_628	Line	Line LINOX 69.0 to 244E6.0S 69.0 Circuit 1
line_629	Line	Line MANOR 69.0 to 25.E3.4S 69.0 Circuit 1
line_630	Line	Line MEMORY 69.0 to 247E5.2S 69.0 Circuit 1

2014 Single Contingency List (Category B)		
Contingency Number	**Type**	**Contingency Name**
line_631	Line	Line MILLER 1 69.0 to MILLER 2 69.0 Circuit 1
line_632	Line	Line MILLER 1 69.0 to 25.E3.5S 69.0 Circuit 1
line_633	Line	Line MILLER 2 69.0 to AMERICA 69.0 Circuit 1
line_634	Line	Line MILLER 2 69.0 to MILLER 3 69.0 Circuit 1
line_635	Line	Line MILLER 3 69.0 to MILLER 4 69.0 Circuit 1
line_636	Line	Line MILLER 4 69.0 to 247E5.2S 69.0 Circuit 1
line_637	Line	Line WAFER 69.0 to WOOD 1 69.0 Circuit 1
line_638	Line	Line WAFER 69.0 to 25.E3.5S 69.0 Circuit 1
line_639	Line	Line AUSTIN 69.0 to 23.E5.4S 69.0 Circuit 1
line_640	Line	Line AUSTIN 69.0 to HOUSTON 69.0 Circuit 1
line_641	Line	Line CEDRSTR2 69.0 to 20.E4.2N 69.0 Circuit 1
line_642	Line	Line GAUCHO 2 69.0 to GAUCHO 3 69.0 Circuit 1
line_643	Line	Line GAUCHO 3 69.0 to GAUCHO 4 69.0 Circuit 1
line_644	Line	Line EVERGREE 69.0 to PIMASRP4 69.0 Circuit 1
line_645	Line	Line EVERGREE 69.0 to 295E8.4N 69.0 Circuit 1
line_646	Line	Line FOUNTAIN 69.0 to 37.E118N 69.0 Circuit 1
line_647	Line	Line FOUNTAIN 69.0 to GLENBROO 69.0 Circuit 1
line_648	Line	Line GLENBROO 69.0 to 34E17N 69.0 Circuit 1
line_649	Line	Line SPEEDWAY 69.0 to 295E8.4N 69.0 Circuit 1
line_650	Line	Line VERDESRP 69.0 to 37.E118N 69.0 Circuit 1
line_651	Line	Line WHEELER 69.0 to MCMULLIN 69.0 Circuit 1
line_652	Line	Line WHEELER 69.0 to 34E17N 69.0 Circuit 1
line_653	Line	Line MCMULLIN 69.0 to 295E8.4N 69.0 Circuit 1
line_654	Line	Line MCMULLIN 69.0 to FOUNTAIN 69.0 Circuit 1
line_655	Line	Line GAUCHO 4 69.0 to 9.5E13.N 69.0 Circuit 1
line_656	Line	Line HOKAM 2 69.0 to HOKAM 3 69.0 Circuit 1
line_657	Line	Line HOKAM 3 69.0 to HOKAM 4 69.0 Circuit 1
line_658	Line	Line HOKAM 4 69.0 to HOKAM 5 69.0 Circuit 1
line_659	Line	Line 36.E1.0N 69.0 to 36.E2.0N 69.0 Circuit 1
line_660	Line	Line BASSHAM 69.0 to THUNDRST 69.0 Circuit 1
line_661	Line	Line BUCKHOR1 69.0 to BUCKHOR2 69.0 Circuit 1
line_662	Line	Line BUCKHOR1 69.0 to LEHI 3 69.0 Circuit 1
line_663	Line	Line BUCKHOR2 69.0 to BUCKHOR3 69.0 Circuit 1
line_664	Line	Line BUCKHOR3 69.0 to BUCKHOR4 69.0 Circuit 1
line_665	Line	Line BUCKHOR4 69.0 to BOONE 69.0 Circuit 1

2014 Single Contingency List (Category B)		
Contingency Number	**Type**	**Contingency Name**
line_666	Line	Line CHOPPER 69.0 to BASSHAM 69.0 Circuit 1
line_667	Line	Line CHOPPER 69.0 to FALCON 1 69.0 Circuit 1
line_668	Line	Line FALCON 3 69.0 to FALCON 4 69.0 Circuit 1
line_669	Line	Line LEISURE1 69.0 to LEISURE2 69.0 Circuit 1
line_670	Line	Line LEISURE2 69.0 to 36.E1.0N 69.0 Circuit 1
line_671	Line	Line LEISURE2 69.0 to LEISURE3 69.0 Circuit 1
line_672	Line	Line LEISURE3 69.0 to THUNDRST 69.0 Circuit 1
line_673	Line	Line LEISURE3 69.0 to LEISURE4 69.0 Circuit 1
line_674	Line	Line LEISURE4 69.0 to VENTURE 69.0 Circuit 1
line_675	Line	Line LEISURE4 69.0 to 34.3E2.N 69.0 Circuit 1
line_676	Line	Line TRYON 69.0 to LEISURE1 69.0 Circuit 1
line_677	Line	Line TRYON 69.0 to 325E2.0N 69.0 Circuit 1
line_678	Line	Line VENTURE 69.0 to 325E2.0N 69.0 Circuit 1
line_679	Line	Line VENTURE 69.0 to 34.3E2.N 69.0 Circuit 1
line_680	Line	Line APACHE 69.0 to THUNDRST 69.0 Circuit 1
line_681	Line	Line APACHE 69.0 to 36.E2.0N 69.0 Circuit 1
line_682	Line	Line BOONE 69.0 to THUNDRST 69.0 Circuit 1
line_683	Line	Line HOKAM 5 69.0 to DOBSON 3 69.0 Circuit 1
line_684	Line	Line PICKREL3 69.0 to 22.E1.0N 69.0 Circuit 1
line_685	Line	Line RICE 2 69.0 to RICE 3 69.0 Circuit 1
line_686	Line	Line RICE 3 69.0 to RICE 4 69.0 Circuit 1
line_687	Line	Line CULBERTS 69.0 to VALVIST3 69.0 Circuit 1
line_688	Line	Line CULBERTS 69.0 to HUGHES 69.0 Circuit 1
line_689	Line	Line FAIRWAY 69.0 to 275E4.0N 69.0 Circuit 1
line_690	Line	Line FAIRWAY 69.0 to HUGHES 69.0 Circuit 1
line_691	Line	Line LEHI 2 69.0 to LEHI 3 69.0 Circuit 1
line_692	Line	Line LEHI 2 69.0 to STAPLEY1 69.0 Circuit 1
line_693	Line	Line LEHI 3 69.0 to LEHI 4 69.0 Circuit 1
line_694	Line	Line LEHI 4 69.0 to VALVIST2 69.0 Circuit 1
line_695	Line	Line REED 1 69.0 to REED 2 69.0 Circuit 1
line_696	Line	Line REED 1 69.0 to 325E2.0N 69.0 Circuit 1
line_697	Line	Line REED 2 69.0 to THUNDRST 69.0 Circuit 1
line_698	Line	Line REED 2 69.0 to REED 3 69.0 Circuit 1
line_699	Line	Line REED 3 69.0 to 29.E0.9N 69.0 Circuit 1
line_700	Line	Line RICE 1 69.0 to RICE 2 69.0 Circuit 1

2014 Single Contingency List (Category B)		
Contingency Number	**Type**	**Contingency Name**
line_701	Line	Line RICE 1 69.0 to 29.E0.9N 69.0 Circuit 1
line_702	Line	Line SOCONHYD 69.0 to VALVIST2 69.0 Circuit 1
line_703	Line	Line STAPLEY1 69.0 to STAPLEY2 69.0 Circuit 1
line_704	Line	Line VALVIST1 69.0 to VALVIST2 69.0 Circuit 1
line_705	Line	Line VALVIST2 69.0 to VALVIST3 69.0 Circuit 1
line_706	Line	Line WOOD 1 69.0 to WOOD 2 69.0 Circuit 1
line_707	Line	Line WOOD 2 69.0 to WOOD 3 69.0 Circuit 1
line_708	Line	Line WOOD 3 69.0 to 28.E1.5S 69.0 Circuit 1
line_709	Line	Line KIRK 69.0 to THUNDRST 69.0 Circuit 1
line_710	Line	Line KIRK 69.0 to CLUFF 69.0 Circuit 1
line_711	Line	Line EALY 2 69.0 to EALY 4 69.0 Circuit 1
line_712	Line	Line NOACK 69.0 to THUNDRST 69.0 Circuit 1
line_713	Line	Line NOACK 69.0 to SGNLBUT2 69.0 Circuit 1
line_714	Line	Line SEATON 1 69.0 to MCCOY 69.0 Circuit 1
line_715	Line	Line SEATON 1 69.0 to SGNLBUT3 69.0 Circuit 1
line_716	Line	Line SHANNON 69.0 to SUPERST4 69.0 Circuit 1
line_717	Line	Line SHANNON 69.0 to SGNLBUT4 69.0 Circuit 1
line_718	Line	Line SGNLBUT1 69.0 to SGNLBUT2 69.0 Circuit 1
line_719	Line	Line SUPERST1 69.0 to SUPERST2 69.0 Circuit 1
line_720	Line	Line SUPERST2 69.0 to SUPERST3 69.0 Circuit 1
line_721	Line	Line SUPERST3 69.0 to SUPERST4 69.0 Circuit 1
line_722	Line	Line CAMERON1 69.0 to CLUFF 69.0 Circuit 1
line_723	Line	Line CAMERON1 69.0 to SUPERST3 69.0 Circuit 1
line_724	Line	Line MCCOY 69.0 to SAGE 1 69.0 Circuit 1
line_725	Line	Line GLENBR02 69.0 to GLENBROO 69.0 Circuit 1
line_726	Line	Line GLENBR02 69.0 to PINKERTO 69.0 Circuit 1
line_727	Line	Line STAPLEY2 69.0 to STAPLEY3 69.0 Circuit 1
line_728	Line	Line LEHI 1 69.0 to LEHI 2 69.0 Circuit 1
line_729	Line	Line SGNLBUT2 69.0 to SGNLBUT3 69.0 Circuit 1
line_730	Line	Line SGNLBUT3 69.0 to SGNLBUT4 69.0 Circuit 1
line_731	Line	Line SAGE 2 69.0 to SAGE 3 69.0 Circuit 1
line_732	Line	Line SAGE 1 69.0 to SAGE 2 69.0 Circuit 1
line_733	Line	Line SAGE 3 69.0 to SAGE 4 69.0 Circuit 1
line_734	Line	Line SAGE 4 69.0 to THUNDRST 69.0 Circuit 1
line_735	Line	Line EALY 1 69.0 to EALY 2 69.0 Circuit 1

2014 Single Contingency List (Category B)		
Contingency Number	**Type**	**Contingency Name**
line_736	Line	Line EALY 1 69.0 to SEATON 1 69.0 Circuit 1
line_737	Line	Line EALY 4 69.0 to SUPERST1 69.0 Circuit 1
line_738	Line	Line FALCON 1 69.0 to FALCON 3 69.0 Circuit 1
line_739	Line	Line FALCON 4 69.0 to VALVIST1 69.0 Circuit 1
line_740	Line	Line FINLEY 69.0 to 29.E1.0S 69.0 Circuit 1
line_741	Line	Line FINLEY 69.0 to 29.E0.9N 69.0 Circuit 1
line_742	Line	Line 34.3E2.N 69.0 to 36.E2.0N 69.0 Circuit 1
line_743	Line	Line 257E3.0N 69.0 to 265E3.0N 69.0 Circuit 1
line_744	Line	Line 25.E3.0N 69.0 to 247E3.0N 69.0 Circuit 1
line_745	Line	Line 211E4.8N 69.0 to 211E4.7N 69.0 Circuit 1
line_746	Line	Line 20.E4.2N 69.0 to 204E4.0N 69.0 Circuit 1
line_747	Line	Line 8.5E1.0N 69.0 to 9.0E3.0N 69.0 Circuit 1
line_748	Line	Line 7.0E1.0N 69.0 to 8.5E1.0N 69.0 Circuit 1
line_749	Line	Line 4.0E1.0N 69.0 to 7.0E1.0N 69.0 Circuit 1
line_750	Line	Line 5.5E9.0N 69.0 to 7.5E9.0N 69.0 Circuit 1
line_751	Line	Line 8.0E7.6N 69.0 to 8.0E7.5N 69.0 Circuit 1
line_752	Line	Line 7.5E9.0N 69.0 to 8.0E7.6N 69.0 Circuit 1
line_753	Line	Line 8.5E7.5N 69.0 to 8.0E7.6N 69.0 Circuit 1
line_754	Line	Line 195E0.5N 69.0 to 20.E1.0S 69.0 Circuit 1
line_755	Line	Line 20.E1.0S 69.0 to 21.E1.0S 69.0 Circuit 1
line_756	Line	Line 21.E1.0S 69.0 to 21.E1.8S 69.0 Circuit 1
line_757	Line	Line 25.E3.5S 69.0 to 25.E3.4S 69.0 Circuit 1
line_758	Line	Line 274E5.2S 69.0 to TWEEDY 69.0 Circuit 1
line_759	Line	Line 28.E5.2S 69.0 to 274E5.2S 69.0 Circuit 1
line_760	Line	Line 28.E4.0S 69.0 to 28.E5.2S 69.0 Circuit 1
line_761	Line	Line 28.E3.0S 69.0 to 28.E4.0S 69.0 Circuit 1
line_762	Line	Line 28.E2.0S 69.0 to 28.E3.0S 69.0 Circuit 1
line_763	Line	Line 29.E2.0S 69.0 to 28.E2.0S 69.0 Circuit 1
line_764	Line	Line 29.E1.0S 69.0 to 295E1.0S 69.0 Circuit 1
line_765	Line	Line 29.E1.0S 69.0 to 28.E1.5S 69.0 Circuit 1
line_766	Line	Line EGAN 69.0 to 41.E9.0S 69.0 Circuit 1
line_767	Line	Line 5.5E8.5N 69.0 to 5.5E9.0N 69.0 Circuit 1
line_768	Line	Line 358E1.0S 69.0 to 35.E3.0S 69.0 Circuit 1
line_769	Line	Line 358E1.0S 69.0 to 36.E1.0N 69.0 Circuit 1
line_770	Line	Line FERRIS 69.0 to JONES 69.0 Circuit 1

2014 Single Contingency List (Category B)		
Contingency Number	**Type**	**Contingency Name**
line_771	Line	Line FERRIS 69.0 to 245E6.0S 69.0 Circuit 1
line_772	Line	Line RIOVERDE 69.0 to 34E17N 69.0 Circuit 1
line_773	Line	Line RIOVERDE 69.0 to PINKERTO 69.0 Circuit 1
line_774	Line	Line WEBBER 69.0 to HUNT 69.0 Circuit 1
line_775	Line	Line WEBBER 69.0 to 436E15.S 69.0 Circuit 1
line_776	Line	Line MICROMIL 69.0 to 42.E9.0S 69.0 Circuit 1
line_777	Line	Line MCREYNO1 69.0 to MCREYNO2 69.0 Circuit 1
line_778	Line	Line CLARK 69.0 to SANTAN 69.0 Circuit 1
line_779	Line	Line MCREYNO2 69.0 to MCREYNO3 69.0 Circuit 1
line_780	Line	Line BROWNING 69.0 to CASEY 69.0 Circuit 1
line_781	Line	Line BROWNING 69.0 to LUNA 69.0 Circuit 1
line_782	Line	Line BROWNING 69.0 to LUNA 69.0 Circuit 2
line_783	Line	Line DINOSAUR 69.0 to HUNT 69.0 Circuit 1
line_784	Line	Line DINOSAUR 69.0 to QUAIL 4 69.0 Circuit 1
line_785	Line	Line DINOSAUR 69.0 to QUEENCRE 69.0 Circuit 1
line_786	Line	Line CRISMON 69.0 to EGAN 69.0 Circuit 1
line_787	Line	Line DINOSAUR 69.0 to MICROMIL 69.0 Circuit 1
line_788	Line	Line ABEL 69.0 to 436E15.S 69.0 Circuit 1
line_789	Line	Line QUAIL G1 69.0 to QUAIL 1 69.0 Circuit 1
line_790	Line	Line QUAIL G2 69.0 to QUAIL 2 69.0 Circuit 1
line_791	Line	Line OLIVE G 69.0 to OLIVE 69.0 Circuit 1
line_792	Line	Line GREENLEE 345.0 to WINCHSTR 345.0 Circuit 1
line_793	Line	Line GREENLEE 345.0 to COPPERVR 345.0 Circuit 1
line_794	Line	Line MCKINLEY 345.0 to SPRINGR 345.0 Circuit 1
line_795	Line	Line MCKINLEY 345.0 to SPRINGR 345.0 Circuit 2
line_796	Line	Line SPRINGR 345.0 to LUNA 345.0 Circuit 1
line_797	Line	Line SPRINGR 345.0 to CORONADO 345.0 Circuit 1
line_798	Line	Line SPRINGR 345.0 to GREENLEE 345.0 Circuit 1
line_799	Line	Line SPRINGR 345.0 to VAIL2 345.0 Circuit 1
line_800	Line	Line VAIL 345.0 to SOUTH 345.0 Circuit 1
line_801	Line	Line WESTWING 345.0 to PINALWES 345.0 Circuit 1
line_802	Line	Line WINCHSTR 345.0 to VAIL 345.0 Circuit 1
line_803	Line	Line PINALWES 345.0 to SOUTH 345.0 Circuit 1
line_804	Line	Line DMP 138.0 to NE.LOOP 138.0 Circuit 1
line_805	Line	Line DMP 138.0 to SN.CRUZ 138.0 Circuit 1

2014 Single Contingency List (Category B)		
Contingency Number	**Type**	**Contingency Name**
line_806	Line	Line DMP 138.0 to NL. EXP 138.0 Circuit 1
line_807	Line	Line DREXEL 138.0 to IRVNGTN 138.0 Circuit 1
line_808	Line	Line DREXEL 138.0 to MIDVALE 138.0 Circuit 1
line_809	Line	Line E. LOOP 138.0 to NE.LOOP 138.0 Circuit 1
line_810	Line	Line E. LOOP 138.0 to ROBERTS 138.0 Circuit 1
line_811	Line	Line E. LOOP 138.0 to PANTANO 138.0 Circuit 1
line_812	Line	Line IRVNGTN 138.0 to TUCSON 138.0 Circuit 1
line_813	Line	Line IRVNGTN 138.0 to VAIL 138.0 Circuit 2
line_814	Line	Line N. LOOP 138.0 to NL. EXP 138.0 Circuit 1
line_815	Line	Line NE.LOOP 138.0 to RILLITO 138.0 Circuit 1
line_816	Line	Line NE.LOOP 138.0 to NELP_SVC 138.0 Circuit 1
line_817	Line	Line RANVISTO 138.0 to LACANADA 138.0 Circuit 1
line_818	Line	Line RILLITO 138.0 to LACANADA 138.0 Circuit 1
line_819	Line	Line S.TRAIL 138.0 to ROBERTS 138.0 Circuit 1
line_820	Line	Line SN.CRUZ 138.0 to IRVNGTN 138.0 Circuit 1
line_821	Line	Line SNYDER 138.0 to E. LOOP 138.0 Circuit 1
line_822	Line	Line SNYDER 138.0 to NE.LOOP 138.0 Circuit 1
line_823	Line	Line SOUTH 138.0 to MIDVALE 138.0 Circuit 1
line_824	Line	Line SOUTH 138.0 to ASARCO 138.0 Circuit 1
line_825	Line	Line SOUTH 138.0 to CYPRUS 138.0 Circuit 1
line_826	Line	Line SOUTH 138.0 to GREENVLY 138.0 Circuit 1
line_827	Line	Line TORTOLIT 138.0 to N. LOOP 138.0 Circuit 4
line_828	Line	Line TORTOLIT 138.0 to RANVISTO 138.0 Circuit 1
line_829	Line	Line TORTOLIT 138.0 to NL. EXP 138.0 Circuit 1
line_830	Line	Line TORTOLIT 138.0 to NL. EXP 138.0 Circuit 2
line_831	Line	Line TORTOLIT 138.0 to NL. EXP 138.0 Circuit 3
line_832	Line	Line TUCSON 138.0 to DELCERRO 138.0 Circuit 1
line_833	Line	Line TWNTYSEC 138.0 to E. LOOP 138.0 Circuit 1
line_834	Line	Line TWNTYSEC 138.0 to IRVNGTN 138.0 Circuit 1
line_835	Line	Line VAIL 138.0 to FT.HUACH 138.0 Circuit 1
line_836	Line	Line VAIL 138.0 to CIENEGA 138.0 Circuit 1
line_837	Line	Line RBWILMOT 138.0 to IRVNGTN 138.0 Circuit 1
line_838	Line	Line RBWILMOT 138.0 to VAIL 138.0 Circuit 1
line_839	Line	Line LOSREALS 138.0 to VAIL 138.0 Circuit 1
line_840	Line	Line PANTANO 138.0 to LOSREALS 138.0 Circuit 1

2014 Single Contingency List (Category B)		
Contingency Number	**Type**	**Contingency Name**
line_841	Line	Line DELCERRO 138.0 to WESTINA 138.0 Circuit 1
line_842	Line	Line GREENVLY 138.0 to CANOARCH 138.0 Circuit 1
line_843	Line	Line CIENEGA 138.0 to S.TRAIL 138.0 Circuit 1
line_844	Line	Line IRV_RING 138.0 to SOUTH 138.0 Circuit 1
line_845	Line	Line KANTOR 115.0 to CANEZ 115.0 Circuit 1
line_846	Line	Line CANEZ 115.0 to SONOITA 115.0 Circuit 1
line_847	Line	Line SONOITA 115.0 to VALNCIA 115.0 Circuit 1
line_848	Line	Line COPPERVR 230.0 to FRISCO 230.0 Circuit 1
line_849	Line	Line PD-MORNC 230.0 to FRISCO 230.0 Circuit 1
line_850	Line	Line NL. EXP 138.0 to RILLITO 138.0 Circuit 1
line_851	Line	Line NL. EXP 138.0 to WESTINA 138.0 Circuit 1
line_852	Line	Line APACH-SW 69.0 to COCHISE 69.0 Circuit 1
line_853	Line	Line APACH-SW 69.0 to KANSAS S 69.0 Circuit 1
line_854	Line	Line APACH-SW 69.0 to WILCOXTP 69.0 Circuit 1
line_855	Line	Line APACHE 115.0 to HAYDENAZ 115.0 Circuit 1
line_856	Line	Line APACHE 230.0 to BUTERFLD 230.0 Circuit 1
line_857	Line	Line APACHE 230.0 to RED TAIL 230.0 Circuit 1
line_858	Line	Line APACHE 230.0 to WINCHSTR 230.0 Circuit 1
line_859	Line	Line AVRA 115.0 to SNDARIO 115.0 Circuit 1
line_860	Line	Line BICKNELL 345.0 to VAIL 345.0 Circuit 1
line_861	Line	Line BICKNELL 115.0 to THREEPNT 115.0 Circuit 1
line_862	Line	Line BUTERFLD 230.0 to PANTANO 230.0 Circuit 1
line_863	Line	Line BUTERFLD 230.0 to SAN RAF 230.0 Circuit 1
line_864	Line	Line DOSCONDO 230.0 to HACKBERY 230.0 Circuit 1
line_865	Line	Line MARANA 115.0 to AVRA 115.0 Circuit 1
line_866	Line	Line MARANATP 115.0 to MARANA 115.0 Circuit 1
line_867	Line	Line MARANATP 115.0 to RATTLSNK 115.0 Circuit 1
line_868	Line	Line MORENCI 230.0 to PD-MORNC 230.0 Circuit 1
line_869	Line	Line MORENCI 230.0 to GREEN-SW 230.0 Circuit 1
line_870	Line	Line PANTANO 115.0 to KARTCHNR 115.0 Circuit 1
line_871	Line	Line PANTANO 230.0 to NEWTUCSN 230.0 Circuit 1
line_872	Line	Line RED TAIL 230.0 to DOSCONDO 230.0 Circuit 1
line_873	Line	Line THREEPNT 115.0 to VALEN-SW 115.0 Circuit 1
line_874	Line	Line THREEPNT 115.0 to SNDARIO 115.0 Circuit 1
line_875	Line	Line DOSCONDO 69.0 to ARTESIA 69.0 Circuit 1

2014 Single Contingency List (Category B)		
Contingency Number	**Type**	**Contingency Name**
line_876	Line	Line DOSCONDO 69.0 to CACTUSAE 69.0 Circuit 1
line_877	Line	Line DOSCONDO 69.0 to SNJOSETP 69.0 Circuit 1
line_878	Line	Line KARTCHNR 69.0 to KEAT JCT 69.0 Circuit 1
line_879	Line	Line KARTCHNR 69.0 to S.VISTA 69.0 Circuit 1
line_880	Line	Line KARTCHNR 69.0 to S.CRUZJT 69.0 Circuit 1
line_881	Line	Line HACKBERY 230.0 to MORENCI 230.0 Circuit 1
line_882	Line	Line HACKBERY 69.0 to THATCHER 69.0 Circuit 1
line_883	Line	Line RED TAIL 69.0 to BOWIE 69.0 Circuit 1
line_884	Line	Line SAN RAF 69.0 to PUEBLO69 69.0 Circuit 1
line_885	Line	Line SAN RAF 69.0 to HAWES SW 69.0 Circuit 1
line_886	Line	Line SAN RAF 69.0 to GARDENSW 69.0 Circuit 1
line_887	Line	Line BICKNELL 69.0 to GREENVLY 69.0 Circuit 1
line_888	Line	Line SAHUARIT 230.0 to BICKNELL 230.0 Circuit 1
line_889	Line	Line ARTESIA 69.0 to SWIFTTRL 69.0 Circuit 1
line_890	Line	Line ARTESIA 69.0 to HOOKERTP 69.0 Circuit 1
line_891	Line	Line CORK TAP 69.0 to THATCHER 69.0 Circuit 1
line_892	Line	Line CORK TAP 69.0 to PIMA69 69.0 Circuit 1
line_893	Line	Line FREEMAN 69.0 to N.THATCH 69.0 Circuit 1
line_894	Line	Line SWIFTTRL 69.0 to SAFFTAP1 69.0 Circuit 1
line_895	Line	Line N.THATCH 69.0 to THATCHER 69.0 Circuit 1
line_896	Line	Line SAFFTAP1 69.0 to CORK TAP 69.0 Circuit 1
line_897	Line	Line SAFFTAP2 69.0 to CACTUSAE 69.0 Circuit 1
line_898	Line	Line SAFFTAP2 69.0 to SAFFORD 69.0 Circuit 1
line_899	Line	Line SNJOSETP 69.0 to ROMNEY 69.0 Circuit 1
line_900	Line	Line SNJOSETP 69.0 to SAN JOSE 69.0 Circuit 1
line_901	Line	Line PIMA69 69.0 to CORK 69.0 Circuit 1
line_902	Line	Line BENSON 69.0 to DAVIDJCT 69.0 Circuit 1
line_903	Line	Line BOWIE 69.0 to SANSIMON 69.0 Circuit 1
line_904	Line	Line BVISTATP 69.0 to B.VISTA 69.0 Circuit 1
line_905	Line	Line BVISTATP 69.0 to CHARLSTN 69.0 Circuit 1
line_906	Line	Line CHARLSTN 69.0 to PUEBLO69 69.0 Circuit 1
line_907	Line	Line COCHISE 69.0 to JOHN JCT 69.0 Circuit 1
line_908	Line	Line DAVIDJCT 69.0 to ST.DAVID 69.0 Circuit 1
line_909	Line	Line DAVIDJCT 69.0 to TOMB JCT 69.0 Circuit 1
line_910	Line	Line HOOKERTP 69.0 to MORT TAP 69.0 Circuit 1

2014 Single Contingency List (Category B)		
Contingency Number	**Type**	**Contingency Name**
line_911	Line	Line HUACHJCT 69.0 to HUACHUCA 69.0 Circuit 1
line_912	Line	Line JOHN JCT 69.0 to MESCALJT 69.0 Circuit 1
line_913	Line	Line KANSAS S 69.0 to CHIRICAH 69.0 Circuit 1
line_914	Line	Line KEAT JCT 69.0 to HAWES 69.0 Circuit 1
line_915	Line	Line KEAT JCT 69.0 to KEATING 69.0 Circuit 1
line_916	Line	Line MORT TAP 69.0 to HOOKER 69.0 Circuit 1
line_917	Line	Line MORT TAP 69.0 to BONITA 69.0 Circuit 1
line_918	Line	Line HAWES SW 69.0 to HAWES 69.0 Circuit 1
line_919	Line	Line HAWES SW 69.0 to GARDENSW 69.0 Circuit 1
line_920	Line	Line S.VISTA 69.0 to BVISTATP 69.0 Circuit 1
line_921	Line	Line ST.DAVID 69.0 to COTTONWD 69.0 Circuit 1
line_922	Line	Line TOMB JCT 69.0 to HUACHJCT 69.0 Circuit 1
line_923	Line	Line TOMB JCT 69.0 to TOMBSTON 69.0 Circuit 1
line_924	Line	Line TOMB JCT 69.0 to WEBB 69.0 Circuit 1
line_925	Line	Line TOMBSTON 69.0 to CHARLSTN 69.0 Circuit 1
line_926	Line	Line WEBB 69.0 to MCNEAL 69.0 Circuit 1
line_927	Line	Line WILCOXTP 69.0 to STEWART 69.0 Circuit 1
line_928	Line	Line WILCOXTP 69.0 to WILLCOX 69.0 Circuit 1
line_929	Line	Line CHIRICAH 69.0 to WEBB 69.0 Circuit 1
line_930	Line	Line HEREFORD 69.0 to PALOMNAS 69.0 Circuit 1
line_931	Line	Line BONITA 69.0 to MORTENSN 69.0 Circuit 1
line_932	Line	Line MESCALJT 69.0 to BENSON 69.0 Circuit 1
line_933	Line	Line MESCALJT 69.0 to MESCAL 69.0 Circuit 1
line_934	Line	Line S.CRUZJT 69.0 to HUACHJCT 69.0 Circuit 1
line_935	Line	Line S.BRKRCH 115.0 to SNMANUEL 115.0 Circuit 1
line_936	Line	Line NEWTUCSN 230.0 to SAHUARIT 230.0 Circuit 1
line_937	Line	Line KINGMANT 69.0 to HUALAPAI 69.0 Circuit 1
line_938	Line	Line HENDRSON 230.0 to MEAD N 230.0 Circuit 1
line_939	Line	Line BC TAP 230.0 to MEAD N 230.0 Circuit 1
line_940	Line	Line H ALLEN 500.0 to MEAD 500.0 Circuit 1
line_941	Line	Line MEAD N 230.0 to ARDEN 230.0 Circuit 1
line_942	Line	Line MEAD N 230.0 to EASTSIDE 230.0 Circuit 1
line_943	Line	Line MEAD N 230.0 to NEWPORT 230.0 Circuit 1
line_944	Line	Line MEAD N 230.0 to EQUEST 230.0 Circuit 2
line_945	Line	Line MEAD N 230.0 to HVRA3A4 230.0 Circuit 1

2014 Single Contingency List (Category B)		
Contingency Number	**Type**	**Contingency Name**
line_946	Line	Line MEAD S 230.0 to PAHRUMP 230.0 Circuit 1
line_947	Line	Line MEAD S 230.0 to EQUEST 230.0 Circuit 1
line_948	Line	Line MEAD S 230.0 to GREENWAY 230.0 Circuit 1
line_949	Line	Line MEAD S 230.0 to MEAD N 230.0 Circuit 1
line_950	Line	Line MEAD S 230.0 to MEAD N 230.0 Circuit 2
line_951	Line	Line MEAD S 230.0 to ELDORDO 230.0 Circuit 1
line_952	Line	Line MEAD S 230.0 to ELDORDO 230.0 Circuit 2
line_953	Line	Line MEAD S 230.0 to MCCULLGH 230.0 Circuit 1
line_954	Line	Line MEAD S 230.0 to MCCULLGH 230.0 Circuit 2
line_955	Line	Line PARKERAZ 69.0 to CLO-TAP 69.0 Circuit 1
line_956	Line	Line PLANETTP 69.0 to BUK-TAP 69.0 Circuit 1
line_957	Line	Line BLYTHE 161.0 to BLYTHEAZ 161.0 Circuit 1
line_958	Line	Line BLYTHE 161.0 to BUCKBLVD 161.0 Circuit 1
line_959	Line	Line BLYTHE 161.0 to GLT TAP 161.0 Circuit 1
line_960	Line	Line BLYTHE 161.0 to HEADGATE 161.0 Circuit 1
line_961	Line	Line BLYTHE 161.0 to BLYTHESC 161.0 Circuit 1
line_962	Line	Line DAVIS 230.0 to RIVIERA 230.0 Circuit 1
line_963	Line	Line DAVIS 230.0 to MEAD N 230.0 Circuit 1
line_964	Line	Line DAVIS 230.0 to TOPOCK 230.0 Circuit 1
line_965	Line	Line DAVIS 230.0 to TOPOCK 230.0 Circuit 2
line_966	Line	Line DAVIS 230.0 to MCCULLGH 230.0 Circuit 1
line_967	Line	Line HOVRA5A6 230.0 to MEAD S 230.0 Circuit 1
line_968	Line	Line HOVRA7-9 230.0 to MEAD S 230.0 Circuit 1
line_969	Line	Line MEAD 500.0 to PERKINS 500.0 Circuit 1
line_970	Line	Line MEAD 500.0 to MARKETPL 500.0 Circuit 1
line_971	Line	Line PARKERAZ 161.0 to BLYTHE 161.0 Circuit 1
line_972	Line	Line PARKERAZ 161.0 to BOUSE 161.0 Circuit 1
line_973	Line	Line PARKERAZ 161.0 to HEADGATE 161.0 Circuit 1
line_974	Line	Line PARKER 230.0 to EAGLEYE 230.0 Circuit 1
line_975	Line	Line PARKER 230.0 to BLK MESA 230.0 Circuit 1
line_976	Line	Line PARKER 230.0 to HAVASU 230.0 Circuit 1
line_977	Line	Line PARKER 230.0 to HARCUVAR 230.0 Circuit 1
line_978	Line	Line PARKER 230.0 to GENE 230.0 Circuit 1
line_979	Line	Line COOLIDGE 115.0 to VLYFARMS 115.0 Circuit 1
line_980	Line	Line COOLIDGE 115.0 to COL-SCIP 115.0 Circuit 1

2014 Single Contingency List (Category B)		
Contingency Number	**Type**	**Contingency Name**
line_981	Line	Line COOLIDGE 115.0 to ED-2 115.0 Circuit 1
line_982	Line	Line COOLIDGE 115.0 to SIGNAL 115.0 Circuit 1
line_983	Line	Line COOLIDGE 230.0 to SUNDANCE 230.0 Circuit 1
line_984	Line	Line COOLIDGE 230.0 to SUNDANCE 230.0 Circuit 2
line_985	Line	Line BOUSE 161.0 to KOFA 161.0 Circuit 1
line_986	Line	Line DEL BAC 115.0 to NGL-WALC 115.0 Circuit 1
line_987	Line	Line GILA YU 161.0 to KNOB 161.0 Circuit 1
line_988	Line	Line GILA YU 161.0 to DOME TAP 161.0 Circuit 1
line_989	Line	Line KNOB 161.0 to DESALTER 161.0 Circuit 1
line_990	Line	Line LIBERTY 230.0 to WESTWNGW 230.0 Circuit 1
line_991	Line	Line LIBERTY 230.0 to RUDD 230.0 Circuit 1
line_992	Line	Line LIBERTY 230.0 to PHX WAPA 230.0 Circuit 1
line_993	Line	Line LIBERTY 230.0 to LONEBUTT 230.0 Circuit 1
line_994	Line	Line LIBERTY 345.0 to PEACOCK 345.0 Circuit 1
line_995	Line	Line MCCONICO 230.0 to DAVIS 230.0 Circuit 1
line_996	Line	Line MCCONICO 230.0 to GRIFFITH 230.0 Circuit 1
line_997	Line	Line ORACLE 115.0 to S.BRKRCH 115.0 Circuit 1
line_998	Line	Line LIBTYPS 230.0 to LIBERTY 230.0 Circuit 2
line_999	Line	Line ADAMSTAP 115.0 to APACHE 115.0 Circuit 1
line_1000	Line	Line ADAMSTAP 115.0 to NGL-WALC 115.0 Circuit 1
line_1001	Line	Line PHX WAPA 230.0 to LONEBUTT 230.0 Circuit 1
line_1002	Line	Line PPKWAPA 230.0 to WESTWNGW 230.0 Circuit 1
line_1003	Line	Line PPKWAPA 230.0 to PINPKSRP 230.0 Circuit 2
line_1004	Line	Line PPKWAPA 230.0 to PINPKSRP 230.0 Circuit 4
line_1005	Line	Line WLTNMOHK 161.0 to GILA YU 161.0 Circuit 1
line_1006	Line	Line TUCSON 115.0 to DEL BAC 115.0 Circuit 1
line_1007	Line	Line TUCSON 115.0 to ORACLE 115.0 Circuit 1
line_1008	Line	Line ED-2 115.0 to ED-4 115.0 Circuit 1
line_1009	Line	Line ED-2 115.0 to BRADY 115.0 Circuit 1
line_1010	Line	Line SIGNAL 115.0 to ED-2 115.0 Circuit 1
line_1011	Line	Line TESTTRAK 230.0 to CASAGRND 230.0 Circuit 1
line_1012	Line	Line ED-5B 115.0 to EMPIRE 115.0 Circuit 1
line_1013	Line	Line ED-5B 115.0 to ED-2 12.5 Circuit 1
line_1014	Line	Line ED-5B 115.0 to ED-5 115.0 Circuit 1
line_1015	Line	Line DOME TAP 161.0 to WLTNMOHK 161.0 Circuit 1

2014 Single Contingency List (Category B)		
Contingency Number	**Type**	**Contingency Name**
line_1016	Line	Line ED-4 115.0 to ELOY 115.0 Circuit 1
line_1017	Line	Line HILLTOP 230.0 to MCCONICO 230.0 Circuit 1
line_1018	Line	Line N.HAVASU 230.0 to PARKER 230.0 Circuit 1
line_1019	Line	Line HOVRN7N8 230.0 to MEAD S 230.0 Circuit 1
line_1020	Line	Line HOVRN5N6 230.0 to MEAD S 230.0 Circuit 1
line_1021	Line	Line HOVRN3N4 230.0 to MEAD S 230.0 Circuit 1
line_1022	Line	Line HOVRN1N2 230.0 to MEAD S 230.0 Circuit 1
line_1023	Line	Line HOVRA1A2 230.0 to MEAD S 230.0 Circuit 1
line_1024	Line	Line ORACLE 69.0 to S.BROOKE 69.0 Circuit 1
line_1025	Line	Line ED-5 115.0 to ED-4 115.0 Circuit 1
line_1026	Line	Line GLT TAP 161.0 to KNOB 161.0 Circuit 1
line_1027	Line	Line PRSCOTWA 230.0 to PRESCOTT 230.0 Circuit 1
line_1028	Line	Line PRSCOTWA 230.0 to RNDVLYTP 230.0 Circuit 1
line_1029	Line	Line GAVLINWA 230.0 to GAVILNPK 230.0 Circuit 1
line_1030	Line	Line GAVLINWA 230.0 to PPKWAPA 230.0 Circuit 1
line_1031	Line	Line GAVLINWA 230.0 to PRSCOTWA 230.0 Circuit 1
line_1032	Line	Line RACEWYWA 230.0 to WESTWNGE 230.0 Circuit 1
line_1033	Line	Line BUK-TAP 69.0 to CLO-TAP 69.0 Circuit 1
line_1034	Line	Line BLACKMTN 115.0 to DEL BAC 115.0 Circuit 1
line_1035	Line	Line BRAWLEY 115.0 to SANXAVER 115.0 Circuit 1
line_1036	Line	Line HARCUVAR 230.0 to HASSYTAP 230.0 Circuit 1
line_1037	Line	Line N.WADDEL 230.0 to RACEWYWA 230.0 Circuit 1
line_1038	Line	Line PICACHOW 115.0 to BRADY 115.0 Circuit 1
line_1039	Line	Line PICACHOW 115.0 to RED ROCK 115.0 Circuit 1
line_1040	Line	Line RATTLSNK 115.0 to TUCSON 115.0 Circuit 1
line_1041	Line	Line RATTLSNK 115.0 to TWINPEAK 115.0 Circuit 1
line_1042	Line	Line RED ROCK 115.0 to SAG.EAST 115.0 Circuit 1
line_1043	Line	Line SANDARIO 115.0 to BRAWLEY 115.0 Circuit 1
line_1044	Line	Line SANXAVER 115.0 to SNYDHILL 115.0 Circuit 1
line_1045	Line	Line SNYDHILL 115.0 to BLACKMTN 115.0 Circuit 1
line_1046	Line	Line SPOOKHIL 230.0 to COOLIDGE 230.0 Circuit 1
line_1047	Line	Line TWINPEAK 115.0 to SANDARIO 115.0 Circuit 1
line_1048	Line	Line TESTTRAK 69.0 to MARICOPA 69.0 Circuit 1
line_1049	Line	Line NGL-WALC 115.0 to KANTOR 115.0 Circuit 1
line_1050	Line	Line CASAGRND 115.0 to EMPIRE 115.0 Circuit 1

2014 Single Contingency List (Category B)		
Contingency Number	**Type**	**Contingency Name**
line_1051	Line	Line LONEBUTT 230.0 to TESTTRAK 230.0 Circuit 1
line_1052	Line	Line LONEBUTT 230.0 to SUNDANCE 230.0 Circuit 1
line_1053	Line	Line SONORA 69.0 to GILA 69.0 Circuit 1
line_1054	Line	Line GRIFFITH 230.0 to PEACOCK 230.0 Circuit 1
line_1055	Line	Line PEACOCK 230.0 to HILLTOP 230.0 Circuit 1
line_1056	Line	Line PEACOCK 345.0 to MEAD 345.0 Circuit 1
line_1057	Line	Line TOPOCK 230.0 to BLK MESA 230.0 Circuit 1
line_1058	Line	Line TOPOCK 230.0 to N.HAVASU 230.0 Circuit 1
line_1059	Line	Line TOPOCK 230.0 to SOPOINT 230.0 Circuit 1
line_1060	Line	Line TOPOCK 230.0 to SOPOINT 230.0 Circuit 2
line_1061	Line	Line KOFA 161.0 to DOME TAP 161.0 Circuit 1
line_1062	Line	Line DAVIS 69.0 to BUL-WALC 69.0 Circuit 1
line_1063	Line	Line HASSYTAP 230.0 to LIBERTY 230.0 Circuit 1
line_1064	Line	Line RNDVLYTP 230.0 to RNDVLYAZ 230.0 Circuit 1
line_1065	Line	Line RNDVLYTP 230.0 to PEACOCK 230.0 Circuit 1
line_1066	Line	Line ROGSWAPA 230.0 to PPKWAPA 230.0 Circuit 1
line_1067	Line	Line ROGSWAPA 230.0 to PPKWAPA 230.0 Circuit 2
line_1068	Line	Line ROGSWAPA 230.0 to SPOOKHIL 230.0 Circuit 1
line_1069	Line	Line HOGBAKTP 115.0 to HOGBAK 115.0 Circuit 1
line_1070	Line	Line WST-WALC 69.0 to WARMSPRG 69.0 Circuit 1
line_1071	Line	Line WST-WALC 69.0 to DUV-WALC 69.0 Circuit 1
line_1072	Line	Line DUV-WALC 69.0 to DUVAL 69.0 Circuit 1
line_1073	Line	Line DUV-WALC 69.0 to KINGMANT 69.0 Circuit 1
line_1074	Line	Line BUL-WALC 69.0 to BULLHEAD 69.0 Circuit 1
line_1075	Line	Line BUL-WALC 69.0 to WST-WALC 69.0 Circuit 1
line_1076	Line	Line CAMINO 230.0 to MEAD S 230.0 Circuit E
line_1077	Line	Line CAMINO 230.0 to MEAD S 230.0 Circuit W
line_1078	Line	Line PINTO PS 345.0 to FOURCORN 345.0 Circuit 1
line_1079	Line	Line SIGURDPS 230.0 to GLENCANY 230.0 Circuit 1
line_1080	Line	Line FLAGSTAF 345.0 to GLENCANY 345.0 Circuit 1
line_1081	Line	Line FLAGSTAF 345.0 to GLENCANY 345.0 Circuit 2
line_1082	Line	Line FLAGSTAF 345.0 to PPK WAPA 345.0 Circuit 1
line_1083	Line	Line FLAGSTAF 345.0 to PPK WAPA 345.0 Circuit 2
line_1084	Line	Line GALLEGOS 115.0 to BERGIN 115.0 Circuit 1
line_1085	Line	Line GLEN PS 230.0 to GLENCANY 230.0 Circuit 2

2014 Single Contingency List (Category B)		
Contingency Number	**Type**	**Contingency Name**
line_1086	Line	Line GLEN PS 230.0 to NAVAJO 230.0 Circuit 1
line_1087	Line	Line KAYENTA 230.0 to SHIPROCK 230.0 Circuit 1
line_1088	Line	Line KAYENTA 230.0 to LNGHOUSE 230.0 Circuit 1
line_1089	Line	Line SHIPROCK 115.0 to FRUITAP 115.0 Circuit 1
line_1090	Line	Line SHIPROCK 115.0 to MESA FM 115.0 Circuit 1
line_1091	Line	Line SHIPROCK 230.0 to FOURCORN 230.0 Circuit 1
line_1092	Line	Line SHIPROCK 345.0 to SAN_JUAN 345.0 Circuit 1
line_1093	Line	Line SHIPROCK 345.0 to FOURCORN 345.0 Circuit 1
line_1094	Line	Line NAVAJO 230.0 to LNGHOUSE 230.0 Circuit 1
line_1095	Line	Line ANIMAS 115.0 to MESA FM 115.0 Circuit 1
line_1096	Line	Line ANIMAS 115.0 to SULLIVAN 115.0 Circuit 1
line_1097	Line	Line BERGIN 115.0 to FOOTHILS 115.0 Circuit 1
line_1098	Line	Line BERGIN 115.0 to SAN JUAN 115.0 Circuit 1
line_1099	Line	Line FOOTHILS 115.0 to HOODMESA 115.0 Circuit 1
line_1100	Line	Line FRUITAP 115.0 to FRUITLND 115.0 Circuit 1
line_1101	Line	Line FRUITAP 115.0 to HOODMESA 115.0 Circuit 1
line_1102	Line	Line GLADETAP 115.0 to HOODMESA 115.0 Circuit 1
line_1103	Line	Line GLADETAP 115.0 to LAPLATA 115.0 Circuit 1
line_1104	Line	Line GLADETAP 115.0 to ELPASOTP 115.0 Circuit 1
line_1105	Line	Line HOODMESA 115.0 to SULLIVAN 115.0 Circuit 1
line_1106	Line	Line NAVAJO 115.0 to SAN JUAN 115.0 Circuit 1
line_1107	Line	Line CHANDLER 69.0 to 28.E3.0S 69.0 Circuit 1
line_1108	Line	Line GILBERT 69.0 to 29.E2.0S 69.0 Circuit 1
line_1109	Line	Line GILBERT 69.0 to 295E1.0S 69.0 Circuit 1
line_1110	Line	Line PAPGOAPE 69.0 to 21E7.25N 69.0 Circuit 1
line_1111	Line	Line Q043B1 500.0 to HDWSH 500.0 Circuit 1
line_1112	Line	Line Q043B2 500.0 to HDWSH 500.0 Circuit 1
line_1113	Line	Line SANPEDRO 69.0 to SPEDROTP 69.0 Circuit 1
line_1114	Line	Line PINAL 69.0 to HAYGULCH 69.0 Circuit 1
line_1115	Line	Line DON LUIS 69.0 to PALOMNAS 69.0 Circuit 1
line_1116	Line	Line DON LUIS 69.0 to MURAL 69.0 Circuit 1
line_1117	Line	Line SANPEDRO 69.0 to MCNEAL 69.0 Circuit 1
line_1118	Line	Line FAIRVIEW 69.0 to SPEDROTP 69.0 Circuit 1
line_1119	Line	Line MURAL 69.0 to SPEDROTP 69.0 Circuit 1
line_1120	Line	Line EASTGATS 69.0 to EGTAP W 69.0 Circuit 1

2014 Single Contingency List (Category B)		
Contingency Number	**Type**	**Contingency Name**
line_1121	Line	Line EASTGATS 69.0 to EGTAP E 69.0 Circuit 1
line_1122	Line	Line VISTA E 69.0 to VISTA W 69.0 Circuit 1
line_1123	Line	Line EASTGATN 69.0 to EASTGATS 69.0 Circuit 1
line_1124	Line	Line EASTGATN 69.0 to VISTA E 69.0 Circuit 1
line_1125	Line	Line SNTAROSA 69.0 to MARICOPA 69.0 Circuit 1
line_1126	Line	Line SNTAROSA 69.0 to ASARCOTP 69.0 Circuit 1
line_1127	Line	Line ASARCO 69.0 to VISTA W 69.0 Circuit 1
line_1128	Line	Line ASARCO 69.0 to SNTAROSA 69.0 Circuit 1
line_1129	Line	Line MILLIGAN 69.0 to ARICA 69.0 Circuit 1
line_1130	Line	Line TOLTEC 69.0 to MILLIGAN 69.0 Circuit 1
line_1131	Line	Line CASGRAPS 69.0 to EGTAP W 69.0 Circuit 1
line_1132	Line	Line ASARCOTP 69.0 to VISTA W 69.0 Circuit 1
line_1133	Line	Line ASARCOTP 69.0 to ASARCO 69.0 Circuit 1
line_1134	Line	Line EGTAP E 69.0 to TOLTEC 69.0 Circuit 1
line_1135	Line	Line EGTAP E 69.0 to EGTAP W 69.0 Circuit 1
line_1136	Line	Line GILA 69.0 to AR FH TP 69.0 Circuit 1
line_1137	Line	Line YUCCA W 69.0 to YUCTAP E 69.0 Circuit 1
line_1138	Line	Line YUCCA W 69.0 to YUCTAP W 69.0 Circuit 1
line_1139	Line	Line YUCTAP E 69.0 to DUPONT 69.0 Circuit 1
line_1140	Line	Line DUPONT 69.0 to 32STREET 69.0 Circuit 1
line_1141	Line	Line YUCTAP W 69.0 to YUCTAP E 69.0 Circuit 1
line_1142	Line	Line YUCTAP W 69.0 to LAGUNA 69.0 Circuit 1
line_1143	Line	Line 32STREET 69.0 to WALDRIP 69.0 Circuit 1
line_1144	Line	Line SANGUINE 69.0 to SW7 69.0 Circuit 1
line_1145	Line	Line SANGUINE 69.0 to MITTRY 69.0 Circuit 1
line_1146	Line	Line SANLUIS 69.0 to BAJA 69.0 Circuit 1
line_1147	Line	Line RVERSIDE 69.0 to YCA 69.0 Circuit 1
line_1148	Line	Line RVERSIDE 69.0 to COCOPAH 69.0 Circuit 1
line_1149	Line	Line RVERSIDE 69.0 to TENTHSTN 69.0 Circuit 1
line_1150	Line	Line MAB S 69.0 to ARABY S 69.0 Circuit 1
line_1151	Line	Line MAB N 69.0 to MAB S 69.0 Circuit 1
line_1152	Line	Line YUCCA E 69.0 to RVERSIDE 69.0 Circuit 1
line_1153	Line	Line YUCCA E 69.0 to YUCCA C 69.0 Circuit 1
line_1154	Line	Line LAGUNA 69.0 to SANLUIS 69.0 Circuit 1
line_1155	Line	Line COCOPAH 69.0 to 32STREET 69.0 Circuit 1

2014 Single Contingency List (Category B)		
Contingency Number	**Type**	**Contingency Name**
line_1156	Line	Line WALDRIP 69.0 to MAB N 69.0 Circuit 1
line_1157	Line	Line WALDRIP 69.0 to BAJA 69.0 Circuit 1
line_1158	Line	Line WALDRIP 69.0 to SONEILL 69.0 Circuit 1
line_1159	Line	Line QUECHAN 69.0 to PACIFIC 69.0 Circuit 1
line_1160	Line	Line IVALON 69.0 to 32STREET 69.0 Circuit 1
line_1161	Line	Line REDONDO 69.0 to SANGUINE 69.0 Circuit 1
line_1162	Line	Line SONEILL 69.0 to MAB N 69.0 Circuit 1
line_1163	Line	Line ARABY N 69.0 to ARABY S 69.0 Circuit 1
line_1164	Line	Line ARABY N 69.0 to AR FH TP 69.0 Circuit 1
line_1165	Line	Line PACIFIC 69.0 to N.GILA 69.0 Circuit 1
line_1166	Line	Line SW7 69.0 to IVALON 69.0 Circuit 1
line_1167	Line	Line N.GILA 69.0 to GILA 69.0 Circuit 1
line_1168	Line	Line N.GILA 69.0 to YPGTAP 69.0 Circuit 1
line_1169	Line	Line N.GILA 69.0 to MITTRY 69.0 Circuit 1
line_1170	Line	Line TENTHSTN 69.0 to QUECHAN 69.0 Circuit 1
line_1171	Line	Line TENTHSTN 69.0 to TENTHSTS 69.0 Circuit 1
line_1172	Line	Line TENTHSTS 69.0 to 32STREET 69.0 Circuit 1
line_1173	Line	Line TENTHSTS 69.0 to COCOPAH 69.0 Circuit 1
line_1174	Line	Line AR FH TP 69.0 to FOTHITAP 69.0 Circuit 1
line_1175	Line	Line YUCCA C 69.0 to YUCCA W 69.0 Circuit 1
line_1176	Line	Line YUCCA C 69.0 to COCOPAH 69.0 Circuit 1
line_1177	Line	Line YPGTAP 69.0 to SENTWASH 69.0 Circuit 1
line_1178	Line	Line FOTHITAP 69.0 to REDONDO 69.0 Circuit 1
line_1179	Line	Line FOTHITAP 69.0 to FOOTHILS 69.0 Circuit 1
line_1180	Line	Line HEADGATE 69.0 to BLACKSW2 69.0 Circuit 1
line_1181	Line	Line BOUSE 161.0 to BLACK PK 161.0 Circuit 1
line_1182	Line	Line BUK-TAP 69.0 to BUCKSKIN 69.0 Circuit 1
line_1183	Line	Line PLANETTP 69.0 to PLANET 69.0 Circuit 1
line_1184	Line	Line CLO-TAP 69.0 to COLORADO 69.0 Circuit 1
line_1185	Line	Line COPRWELL 69.0 to QUARZSIT 69.0 Circuit 1
line_1186	Line	Line COPRWELL 69.0 to COPRMINE 69.0 Circuit 1
line_1187	Line	Line MC VAYTP 69.0 to UTTING 69.0 Circuit 1
line_1188	Line	Line QUARZTAP 69.0 to COPRWELL 69.0 Circuit 1
line_1189	Line	Line QUARZTAP 69.0 to BLACKSW1 69.0 Circuit 1
line_1190	Line	Line QUARZTAP 69.0 to BLACK PK 69.0 Circuit 1

2014 Single Contingency List (Category B)		
Contingency Number	**Type**	**Contingency Name**
line_1191	Line	Line BLACKSW1 69.0 to BLACKSW2 69.0 Circuit 1
line_1192	Line	Line BLACKSW1 69.0 to HAVASUTP 69.0 Circuit 1
line_1193	Line	Line HAVASUTP 69.0 to HAVASU 69.0 Circuit 1
line_1194	Line	Line VCKSBGTP 69.0 to MC VAYTP 69.0 Circuit 1
line_1195	Line	Line VCKSBGTP 69.0 to VICKSBRG 69.0 Circuit 1
line_1196	Line	Line SALOME 69.0 to VCKSBGTP 69.0 Circuit 1
line_1197	Line	Line BLACK PK 69.0 to UTTING 69.0 Circuit 1
line_1198	Line	Line AGUILA 69.0 to FLYINGE 69.0 Circuit 1
line_1199	Line	Line OBERLIN 69.0 to PATTON 69.0 Circuit 1
line_1200	Line	Line WICKNBRG 69.0 to FLORES 69.0 Circuit 1
line_1201	Line	Line WICKNBTP 69.0 to WICKNBRG 69.0 Circuit 1
line_1202	Line	Line WICKNBTP 69.0 to MORISTWN 69.0 Circuit 1
line_1203	Line	Line PATTONTP 69.0 to OBERLIN 69.0 Circuit 1
line_1204	Line	Line PATTONTP 69.0 to MORISTWN 69.0 Circuit 1
line_1205	Line	Line EAGLEY E 69.0 to AGUILA 69.0 Circuit 1
line_1206	Line	Line EAGLEY E 69.0 to EAGLEY W 69.0 Circuit 1
line_1207	Line	Line FLYINGE 69.0 to WICKNBRG 69.0 Circuit 1
line_1208	Line	Line FLYINGE 69.0 to WICKNBTP 69.0 Circuit 1
line_1209	Line	Line EAGLEY W 69.0 to SALOME 69.0 Circuit 1
line_1210	Line	Line FLORES 69.0 to YARNELL 69.0 Circuit 1
line_1211	Line	Line YAVAPAIW 69.0 to YAVAPATP 69.0 Circuit 1
line_1212	Line	Line DELANOTP 69.0 to PRCITY 69.0 Circuit 1
line_1213	Line	Line DELANOTP 69.0 to DELANO E 69.0 Circuit 1
line_1214	Line	Line QUAILSPN 69.0 to COTNWOOD 69.0 Circuit 1
line_1215	Line	Line WILHOIT 69.0 to KIRK JCT 69.0 Circuit 1
line_1216	Line	Line PRCITY 69.0 to WHITSPAR 69.0 Circuit 1
line_1217	Line	Line PRCITY 69.0 to WHITSPAR 69.0 Circuit 2
line_1218	Line	Line WILOWLKE 69.0 to WILOWLKW 69.0 Circuit 1
line_1219	Line	Line WILOWLKE 69.0 to WELLFELD 69.0 Circuit 1
line_1220	Line	Line WILOWLKE 69.0 to SUNDOGTP 69.0 Circuit 1
line_1221	Line	Line WILOWLKE 69.0 to ANTELOPE 69.0 Circuit 1
line_1222	Line	Line WILOWLKE 69.0 to PRCITYTP 69.0 Circuit 1
line_1223	Line	Line WILOWLKW 69.0 to DELANOTP 69.0 Circuit 1
line_1224	Line	Line WILOWLKW 69.0 to GREYBRTP 69.0 Circuit 1
line_1225	Line	Line SEDONA 69.0 to CAPBUTTE 69.0 Circuit 1

2014 Single Contingency List (Category B)		
Contingency Number	**Type**	**Contingency Name**
line_1226	Line	Line SEDONA 69.0 to MUNDPKTP 69.0 Circuit 1
line_1227	Line	Line QUAILSPN 69.0 to QUAILSPS 69.0 Circuit 1
line_1228	Line	Line QUAILSPN 69.0 to CORNVLTP 69.0 Circuit 1
line_1229	Line	Line CEMENT 69.0 to VERDE 69.0 Circuit 1
line_1230	Line	Line POLAND 69.0 to DEWEY S 69.0 Circuit 1
line_1231	Line	Line POLAND 69.0 to MCCABETP 69.0 Circuit 1
line_1232	Line	Line IRVING 69.0 to STRAWBTP 69.0 Circuit 1
line_1233	Line	Line BALDMTNN 69.0 to BALDMTNS 69.0 Circuit 1
line_1234	Line	Line CHILDS 69.0 to SYCAMOR 69.0 Circuit 1
line_1235	Line	Line CHILDS 69.0 to IRVING 69.0 Circuit 1
line_1236	Line	Line CHILDS 69.0 to COPCANYN 69.0 Circuit 1
line_1237	Line	Line WELLFELD 69.0 to LONEVL S 69.0 Circuit 1
line_1238	Line	Line SUNDOG E 69.0 to BALDMTNN 69.0 Circuit 1
line_1239	Line	Line SUNDOG W 69.0 to SUNDOG E 69.0 Circuit 1
line_1240	Line	Line CTWDTIE 69.0 to COTNWOOD 69.0 Circuit 1
line_1241	Line	Line CTWDTIE 69.0 to TAPCOTIE 69.0 Circuit 1
line_1242	Line	Line SUNDOGTP 69.0 to SUNDOG W 69.0 Circuit 1
line_1243	Line	Line SUNDOGTP 69.0 to PRCITYTP 69.0 Circuit 1
line_1244	Line	Line DEWEY N 69.0 to DEWEY S 69.0 Circuit 1
line_1245	Line	Line CORNVLTP 69.0 to CORNVIL 69.0 Circuit 1
line_1246	Line	Line CORNVLTP 69.0 to MCGUIRVL 69.0 Circuit 1
line_1247	Line	Line OAKCRKTP 69.0 to CAPBUTTE 69.0 Circuit 1
line_1248	Line	Line OAKCRKTP 69.0 to OAKCREEK 69.0 Circuit 1
line_1249	Line	Line BALDMTNS 69.0 to DEWEY N 69.0 Circuit 1
line_1250	Line	Line STMRGRTP 69.0 to STRMRUGR 69.0 Circuit 1
line_1251	Line	Line MINGUSTP 69.0 to YAVAPATP 69.0 Circuit 1
line_1252	Line	Line MINGUSTP 69.0 to MINGUS 69.0 Circuit 1
line_1253	Line	Line MINGUSTP 69.0 to TAPCOTIE 69.0 Circuit 1
line_1254	Line	Line TAPCOTIE 69.0 to VERDE 69.0 Circuit 1
line_1255	Line	Line KIRK JCT 69.0 to YARNELL 69.0 Circuit 1
line_1256	Line	Line DUGAS 69.0 to ORMESAPS 69.0 Circuit 1
line_1257	Line	Line DUGAS 69.0 to COPCANYN 69.0 Circuit 1
line_1258	Line	Line LONEVL N 69.0 to YAVAPATP 69.0 Circuit 1
line_1259	Line	Line LONEVL N 69.0 to DEWEY N 69.0 Circuit 1
line_1260	Line	Line LONEVL N 69.0 to LONEVL S 69.0 Circuit 1

2014 Single Contingency List (Category B)		
Contingency Number	**Type**	**Contingency Name**
line_1261	Line	Line CORDESTP 69.0 to POLAND 69.0 Circuit 1
line_1262	Line	Line CORDESTP 69.0 to DUGAS 69.0 Circuit 1
line_1263	Line	Line CORDESTP 69.0 to CORDES 69.0 Circuit 1
line_1264	Line	Line ANTELOPE 69.0 to STMRGRTP 69.0 Circuit 1
line_1265	Line	Line DRAKE 69.0 to WILMSTAP 69.0 Circuit 1
line_1266	Line	Line WHITSPAR 69.0 to WILHOIT 69.0 Circuit 1
line_1267	Line	Line CHINOEST 69.0 to CHINOWST 69.0 Circuit 1
line_1268	Line	Line CHINOEST 69.0 to CHINOWLS 69.0 Circuit 1
line_1269	Line	Line CHINOTAP 69.0 to CHINOEST 69.0 Circuit 1
line_1270	Line	Line CHINOTAP 69.0 to OHM 69.0 Circuit 1
line_1271	Line	Line HAYFLDTP 69.0 to QUAILSPS 69.0 Circuit 1
line_1272	Line	Line HAYFLDTP 69.0 to HAYFLDDR 69.0 Circuit 1
line_1273	Line	Line VERDE 69.0 to CTWDTIE 69.0 Circuit 1
line_1274	Line	Line VERDE 69.0 to OAKCRKTP 69.0 Circuit 1
line_1275	Line	Line ORMESAPS 69.0 to SYCAMOR 69.0 Circuit 1
line_1276	Line	Line CHINOWST 69.0 to CHNOVLYS 69.0 Circuit 1
line_1277	Line	Line COPCANYN 69.0 to HAYFLDTP 69.0 Circuit 1
line_1278	Line	Line CHNOVLYN 69.0 to CHNOVLYS 69.0 Circuit 1
line_1279	Line	Line PRCITYTP 69.0 to PRCITY 69.0 Circuit 1
line_1280	Line	Line PAULDN 69.0 to DRAKE 69.0 Circuit 1
line_1281	Line	Line PAULDN 69.0 to CHNOVLYN 69.0 Circuit 1
line_1282	Line	Line GREYBRTP 69.0 to CHINOWST 69.0 Circuit 1
line_1283	Line	Line GREYBRTP 69.0 to GREYBERS 69.0 Circuit 1
line_1284	Line	Line TUBACYTP 69.0 to GAP 69.0 Circuit 1
line_1285	Line	Line TUBACYTP 69.0 to TUBACITY 69.0 Circuit 1
line_1286	Line	Line POLLOCK 69.0 to PAULDN 69.0 Circuit 1
line_1287	Line	Line COCONINO 69.0 to WINONA 69.0 Circuit 1
line_1288	Line	Line COCONINO 69.0 to ELDEN S 69.0 Circuit 1
line_1289	Line	Line COCONINO 69.0 to SWITZER 69.0 Circuit 1
line_1290	Line	Line COCONINO 69.0 to WODYMTTP 69.0 Circuit 1
line_1291	Line	Line SANDVIG 69.0 to ELDEN N 69.0 Circuit 1
line_1292	Line	Line SANDVIG 69.0 to BMTAP 69.0 Circuit 1
line_1293	Line	Line WINSLOWB 69.0 to BLURDG 69.0 Circuit 1
line_1294	Line	Line WINSLOW 69.0 to LEUPPJCT 69.0 Circuit 1
line_1295	Line	Line WINSLOW 69.0 to WINSLOWB 69.0 Circuit 1

2014 Single Contingency List (Category B)		
Contingency Number	**Type**	**Contingency Name**
line_1296	Line	Line WINSLOW 69.0 to CHLCONST 69.0 Circuit 1
line_1297	Line	Line BLKMESA 69.0 to BMTAP 69.0 Circuit 1
line_1298	Line	Line PADRE 69.0 to TWNARRWS 69.0 Circuit 1
line_1299	Line	Line LEROUXTP 69.0 to LEROUX 69.0 Circuit 1
line_1300	Line	Line LEROUXTP 69.0 to WOODRUFF 69.0 Circuit 1
line_1301	Line	Line LEROUX 69.0 to INDWELLS 69.0 Circuit 1
line_1302	Line	Line LECHE 69.0 to GAP 69.0 Circuit 1
line_1303	Line	Line OHM 69.0 to YAVAPAIW 69.0 Circuit 1
line_1304	Line	Line OHM 69.0 to PAULDN 69.0 Circuit 1
line_1305	Line	Line TUSAYAN 69.0 to VALLE 69.0 Circuit 1
line_1306	Line	Line WLMSPNGT 69.0 to WLMSEPNG 69.0 Circuit 1
line_1307	Line	Line WLMSPNGT 69.0 to NAVORDAN 69.0 Circuit 1
line_1308	Line	Line ELDEN N 69.0 to ELDEN S 69.0 Circuit 1
line_1309	Line	Line REDLAKE 69.0 to RAMONOSO 69.0 Circuit 1
line_1310	Line	Line REDLAKE 69.0 to WILIAMS 69.0 Circuit 1
line_1311	Line	Line SUNSHINE 69.0 to LEUPPJCT 69.0 Circuit 1
line_1312	Line	Line KACHVILL 69.0 to COCONINO 69.0 Circuit 1
line_1313	Line	Line CAMERON 69.0 to TUBACYTP 69.0 Circuit 1
line_1314	Line	Line POWELL1 69.0 to LECHE 69.0 Circuit 1
line_1315	Line	Line ASHFORK 69.0 to POLLOCK 69.0 Circuit 1
line_1316	Line	Line ASHFORK 69.0 to PINSPRNG 69.0 Circuit 1
line_1317	Line	Line GRANDCAN 69.0 to TUSAYAN 69.0 Circuit 1
line_1318	Line	Line PINSPRNG 69.0 to WILIAMS 69.0 Circuit 1
line_1319	Line	Line TONTO 69.0 to MAZATZAL 69.0 Circuit 1
line_1320	Line	Line MUNDPKTP 69.0 to KACHVILL 69.0 Circuit 1
line_1321	Line	Line MUNDPKTP 69.0 to MUNDPARK 69.0 Circuit 1
line_1322	Line	Line STRAWBTP 69.0 to TONTO 69.0 Circuit 1
line_1323	Line	Line STRAWBTP 69.0 to STRAWBRY 69.0 Circuit 1
line_1324	Line	Line GARLNDAZ 69.0 to WLMSPNGT 69.0 Circuit 1
line_1325	Line	Line SWITZER 69.0 to SANDVIG 69.0 Circuit 1
line_1326	Line	Line CATARACT 69.0 to RAMONOSO 69.0 Circuit 1
line_1327	Line	Line CATARACT 69.0 to VALLE 69.0 Circuit 1
line_1328	Line	Line WILMSTAP 69.0 to COCONINO 69.0 Circuit 1
line_1329	Line	Line WILMSTAP 69.0 to WILIAMS 69.0 Circuit 1
line_1330	Line	Line JEDDITO 69.0 to KEAMCNYN 69.0 Circuit 1

2014 Single Contingency List (Category B)		
Contingency Number	**Type**	**Contingency Name**
line_1331	Line	Line WODYMTTP 69.0 to WOODYMTN 69.0 Circuit 1
line_1332	Line	Line WODYMTTP 69.0 to NAVORDAN 69.0 Circuit 1
line_1333	Line	Line INDWELLS 69.0 to JEDDITO 69.0 Circuit 1
line_1334	Line	Line BMTAP 69.0 to CAMERON 69.0 Circuit 1
line_1335	Line	Line WILIAMS 69.0 to GARLNDAZ 69.0 Circuit 1
line_1336	Line	Line SHOWLOW 69.0 to SHUMWAY 69.0 Circuit 1
line_1337	Line	Line SHOWLOW 69.0 to VERNONX 69.0 Circuit 1
line_1338	Line	Line CHOLLA1 69.0 to LEROUX 69.0 Circuit 1
line_1339	Line	Line CHOLLA1 69.0 to RC-WT 69.0 Circuit 1
line_1340	Line	Line CHOLLA1 69.0 to CHOLLA2 69.0 Circuit 1
line_1341	Line	Line SGRLF 69.0 to ZENIFF 69.0 Circuit 1
line_1342	Line	Line SGRLF 69.0 to SNOWFLAK 69.0 Circuit 1
line_1343	Line	Line PRECHCYN 69.0 to TONTO 69.0 Circuit 1
line_1344	Line	Line RC-ET 69.0 to RC-E 69.0 Circuit 1
line_1345	Line	Line RC-ET 69.0 to WOODRUFF 69.0 Circuit 1
line_1346	Line	Line LINDEN 69.0 to SHOWLOW 69.0 Circuit 1
line_1347	Line	Line LINDEN 69.0 to ZENIFF 69.0 Circuit 1
line_1348	Line	Line ZENIFF 69.0 to HEBER 69.0 Circuit 1
line_1349	Line	Line ZENIFF 69.0 to ABITIBI 69.0 Circuit 1
line_1350	Line	Line TWNARRWS 69.0 to SUNSHINE 69.0 Circuit 1
line_1351	Line	Line BACON 69.0 to RC-ET 69.0 Circuit 1
line_1352	Line	Line BACON 69.0 to SNOWFLAK 69.0 Circuit 1
line_1353	Line	Line SNOWFLAK 69.0 to SHUMWAY 69.0 Circuit 1
line_1354	Line	Line RC-WT 69.0 to RC-W 69.0 Circuit 1
line_1355	Line	Line RC-WT 69.0 to ZENIFF 69.0 Circuit 1
line_1356	Line	Line CHOLLA2 69.0 to CHLCONST 69.0 Circuit 1
line_1357	Line	Line CHOLLA2 69.0 to LEROUXTP 69.0 Circuit 1
line_1358	Line	Line $CORONAD 69.0 to ST.JOHNS 69.0 Circuit 1
line_1359	Line	Line WAGONTAP 69.0 to WAGONWHL 69.0 Circuit 1
line_1360	Line	Line WAGONTAP 69.0 to PEAPS 69.0 Circuit 1
line_1361	Line	Line WAGONTAP 69.0 to PINETOP 69.0 Circuit 1
line_1362	Line	Line VERNONX 69.0 to GREERTAP 69.0 Circuit 1
line_1363	Line	Line ALCHESAY 69.0 to GREENSPK 69.0 Circuit 1
line_1364	Line	Line ALCHESAY 69.0 to DRUMBEAT 69.0 Circuit 1
line_1365	Line	Line ST.JOHNS 69.0 to CONCHO 69.0 Circuit 1

2014 Single Contingency List (Category B)		
Contingency Number	**Type**	**Contingency Name**
line_1366	Line	Line SPRNGRMT 69.0 to ALCHESAY 69.0 Circuit 1
line_1367	Line	Line GREERTAP 69.0 to RNDVLLEY 69.0 Circuit 1
line_1368	Line	Line GREENSPK 69.0 to RNDVLLEY 69.0 Circuit 1
line_1369	Line	Line PEAPS 69.0 to SHOWLOW 69.0 Circuit 1
line_1370	Line	Line PEAPS 69.0 to SPRNGRMT 69.0 Circuit 1
line_1371	Line	Line CONCHO 69.0 to VERNONX 69.0 Circuit 1
line_1372	Line	Line PINETOP 69.0 to ALCHESAY 69.0 Circuit 1
line_1373	Line	Line CHINOTAP 69.0 to GRNITCRK 69.0 Circuit 1
line_1374	Line	Line GRNITCRK 69.0 to STMRGRTP 69.0 Circuit 1
line_1375	Line	Line YOUNGSCY 69.0 to PADRE 69.0 Circuit 1
line_1376	Line	Line YOUNGSCY 69.0 to SANDVIG 69.0 Circuit 1
line_1377	Line	Line WINONA 69.0 to YOUNGSCY 69.0 Circuit 1
line_1378	Line	Line POLK W 69.0 to FORTIPLE 69.0 Circuit 1
line_1379	Line	Line GARFIELN 69.0 to GARFIELS 69.0 Circuit 1
line_1380	Line	Line GARFIELS 69.0 to CHURCHTP 69.0 Circuit 1
line_1381	Line	Line GARFIELW 69.0 to GARFIELE 69.0 Circuit 1
line_1382	Line	Line GARFIELW 69.0 to FILMTAP 69.0 Circuit 1
line_1383	Line	Line SHERMANN 69.0 to SHERMANS 69.0 Circuit 1
line_1384	Line	Line METRO C 69.0 to METRO W 69.0 Circuit 1
line_1385	Line	Line METRO C 69.0 to METRO E 69.0 Circuit 1
line_1386	Line	Line MEADOWBN 69.0 to ORANGWDW 69.0 Circuit 1
line_1387	Line	Line MEADOWBC 69.0 to MEADOWBS 69.0 Circuit 1
line_1388	Line	Line MEADOWBC 69.0 to MEADOWBN 69.0 Circuit 1
line_1389	Line	Line MEADOWBC 69.0 to INDINOLC 69.0 Circuit 1
line_1390	Line	Line FORTIPLW 69.0 to FORTIPLE 69.0 Circuit 1
line_1391	Line	Line SHERMANS 69.0 to WPHXAPSN 69.0 Circuit 1
line_1392	Line	Line FILMTAP 69.0 to GARFIELN 69.0 Circuit 1
line_1393	Line	Line FILLMORN 69.0 to FILMTAP 69.0 Circuit 1
line_1394	Line	Line FILLMORN 69.0 to FILLMORS 69.0 Circuit 1
line_1395	Line	Line MCDOWELS 69.0 to ENCANTOE 69.0 Circuit 1
line_1396	Line	Line MCDOWELN 69.0 to WPHXAPSS 69.0 Circuit 1
line_1397	Line	Line MCDWLTPN 69.0 to MCDOWELN 69.0 Circuit 1
line_1398	Line	Line MCDWLTPN 69.0 to LIBIRNTP 69.0 Circuit 1
line_1399	Line	Line BUTTE C 69.0 to BUTTE W 69.0 Circuit 1
line_1400	Line	Line BUTTE E 69.0 to BUTTE C2 69.0 Circuit 1

2014 Single Contingency List (Category B)		
Contingency Number	**Type**	**Contingency Name**
line_1401	Line	Line BUTTE E 69.0 to OCOTIL S 69.0 Circuit 1
line_1402	Line	Line BUTTE W 69.0 to OCOTIL N 69.0 Circuit 1
line_1403	Line	Line HARBOR C 69.0 to HARBOR E 69.0 Circuit 1
line_1404	Line	Line HARBOR W 69.0 to HARBOR C 69.0 Circuit 1
line_1405	Line	Line BUTTE C2 69.0 to BUTTE C 69.0 Circuit 1
line_1406	Line	Line BUTTE C2 69.0 to OCOTIL C 69.0 Circuit 1
line_1407	Line	Line HOHOKAMN 69.0 to JACKSONE 69.0 Circuit 1
line_1408	Line	Line HOHOKAMS 69.0 to HOHOKAMN 69.0 Circuit 1
line_1409	Line	Line MCDOWELN 69.0 to MCDOWELS 69.0 Circuit 1
line_1410	Line	Line YALE S 69.0 to YALE C 69.0 Circuit 1
line_1411	Line	Line YALE S 69.0 to 23RDSTRE 69.0 Circuit 1
line_1412	Line	Line YALE N 69.0 to MEADOWBS 69.0 Circuit 1
line_1413	Line	Line YALE C 69.0 to YALE N 69.0 Circuit 1
line_1414	Line	Line ENCANTOW 69.0 to ENCANTOE 69.0 Circuit 1
line_1415	Line	Line OCOTIL C 69.0 to OCOTIL S 69.0 Circuit 1
line_1416	Line	Line OCOTIL C 69.0 to TEMPE W 69.0 Circuit 1
line_1417	Line	Line OCOTIL C 69.0 to TEMPE E 69.0 Circuit 1
line_1418	Line	Line OCOTIL C 69.0 to CAMELBKN 69.0 Circuit 1
line_1419	Line	Line OCOTIL N 69.0 to OCOTIL C 69.0 Circuit 1
line_1420	Line	Line MALINTP 69.0 to DURNGOTP 69.0 Circuit 1
line_1421	Line	Line MALINTP 69.0 to DURNGOT3 69.0 Circuit 1
line_1422	Line	Line 23RDSTRE 69.0 to FORTIPLW 69.0 Circuit 1
line_1423	Line	Line 23RDSTRE 69.0 to 23RDSTRW 69.0 Circuit 1
line_1424	Line	Line 23RDSTRW 69.0 to HARBOR E 69.0 Circuit 1
line_1425	Line	Line OCOTIL S 69.0 to POLK E 69.0 Circuit 1
line_1426	Line	Line INDINOLC 69.0 to INDINOLE 69.0 Circuit 1
line_1427	Line	Line INDINOLC 69.0 to INDINOLW 69.0 Circuit 1
line_1428	Line	Line INDINOLW 69.0 to METRO W 69.0 Circuit 1
line_1429	Line	Line WPHXAPSC 69.0 to MCDWLTPN 69.0 Circuit 1
line_1430	Line	Line WPHXAPSC 69.0 to WPHXAPSS 69.0 Circuit 1
line_1431	Line	Line WPHXAPSN 69.0 to WPHXAPSC 69.0 Circuit 1
line_1432	Line	Line WPHXAPSS 69.0 to MALINTP 69.0 Circuit 1
line_1433	Line	Line DURNGOTP 69.0 to ELWOOD 69.0 Circuit 1
line_1434	Line	Line DURNGOTP 69.0 to DURANGOS 69.0 Circuit 1
line_1435	Line	Line CHURCH C 69.0 to CHURCH W 69.0 Circuit 1

2014 Single Contingency List (Category B)		
Contingency Number	**Type**	**Contingency Name**
line_1436	Line	Line CHURCH E 69.0 to CHURCH C 69.0 Circuit 1
line_1437	Line	Line DURANGON 69.0 to DURNGOT3 69.0 Circuit 1
line_1438	Line	Line DURANGON 69.0 to DURANGOS 69.0 Circuit 1
line_1439	Line	Line CHURCH W 69.0 to CHURCHTP 69.0 Circuit 1
line_1440	Line	Line JACKSONC 69.0 to JACKSONE 69.0 Circuit 1
line_1441	Line	Line JACKSONC 69.0 to JACKSONW 69.0 Circuit 1
line_1442	Line	Line CHURCHTP 69.0 to GARFIELE 69.0 Circuit 1
line_1443	Line	Line JACKSONW 69.0 to 23RDSTRW 69.0 Circuit 1
line_1444	Line	Line LINWESTN 69.0 to SHERMANN 69.0 Circuit 1
line_1445	Line	Line LINWESTN 69.0 to 23RDSTRE 69.0 Circuit 1
line_1446	Line	Line LINWESTN 69.0 to DURNGOT3 69.0 Circuit 1
line_1447	Line	Line TEMPE W 69.0 to TEMPE E 69.0 Circuit 1
line_1448	Line	Line TEMPE W 69.0 to HOHOKAMS 69.0 Circuit 1
line_1449	Line	Line LINCOLNW 69.0 to LINWESTN 69.0 Circuit 1
line_1450	Line	Line LINCOLNE 69.0 to HARBOR W 69.0 Circuit 1
line_1451	Line	Line LINCOLNE 69.0 to LINCOLNW 69.0 Circuit 1
line_1452	Line	Line LIBIRNTP 69.0 to FILLMORS 69.0 Circuit 1
line_1453	Line	Line LIBIRNTP 69.0 to LIBIRON 69.0 Circuit 1
line_1454	Line	Line CTRYCLBC 69.0 to CHURCH E 69.0 Circuit 1
line_1455	Line	Line CTRYCLBC 69.0 to CTRYCLBN 69.0 Circuit 1
line_1456	Line	Line CTRYCLBC 69.0 to CTRYCLBS 69.0 Circuit 1
line_1457	Line	Line CTRYCLBN 69.0 to METRO E 69.0 Circuit 1
line_1458	Line	Line CTRYCLBN 69.0 to YALE C 69.0 Circuit 1
line_1459	Line	Line CTRYCLBS 69.0 to ENCANTOW 69.0 Circuit 1
line_1460	Line	Line CTRYCLBS 69.0 to INDINOLE 69.0 Circuit 1
line_1461	Line	Line POLK E 69.0 to POLK W 69.0 Circuit 1
line_1462	Line	Line CENTURYW 69.0 to INDBENDW 69.0 Circuit 1
line_1463	Line	Line CENTURYW 69.0 to CENTURYE 69.0 Circuit 1
line_1464	Line	Line ROADRUNS 69.0 to DOUBLTRS 69.0 Circuit 1
line_1465	Line	Line JOMAX E 69.0 to DOVEVLYS 69.0 Circuit 1
line_1466	Line	Line JOMAX W 69.0 to JOMAX E 69.0 Circuit 1
line_1467	Line	Line BLVD E 69.0 to CLINIC E 69.0 Circuit 1
line_1468	Line	Line CLINIC W 69.0 to DESPRNGN 69.0 Circuit 1
line_1469	Line	Line BLVD W 69.0 to BLVD E 69.0 Circuit 1
line_1470	Line	Line BLVD W 69.0 to REACH 69.0 Circuit 1

2014 Single Contingency List (Category B)		
Contingency Number	**Type**	**Contingency Name**
line_1471	Line	Line SHEA W 69.0 to SHEA E 69.0 Circuit 1
line_1472	Line	Line RAINTRES 69.0 to CHAPRALE 69.0 Circuit 1
line_1473	Line	Line ACOMA W 69.0 to ACOMA E 69.0 Circuit 1
line_1474	Line	Line MUMMYMTW 69.0 to MUMMYMTE 69.0 Circuit 1
line_1475	Line	Line DALE S 69.0 to DALE N 69.0 Circuit 1
line_1476	Line	Line DALE S 69.0 to PINPKEST 69.0 Circuit 1
line_1477	Line	Line DALE S 69.0 to STGCOACH 69.0 Circuit 1
line_1478	Line	Line RAINTREN 69.0 to RAINTRES 69.0 Circuit 1
line_1479	Line	Line GRNITRF 69.0 to ACOMA W 69.0 Circuit 1
line_1480	Line	Line MCORMCKW 69.0 to MCORMCKE 69.0 Circuit 1
line_1481	Line	Line CACTUS C 69.0 to CACTUS W 69.0 Circuit 1
line_1482	Line	Line RAWHIDEW 69.0 to RAWHIDEE 69.0 Circuit 1
line_1483	Line	Line RAWHIDEW 69.0 to DOWNINGW 69.0 Circuit 1
line_1484	Line	Line DESPRNGN 69.0 to DESPRNGS 69.0 Circuit 1
line_1485	Line	Line PINPKEST 69.0 to DOWNINGE 69.0 Circuit 1
line_1486	Line	Line PINPKEST 69.0 to CLGRNDEE 69.0 Circuit 1
line_1487	Line	Line DIXILETE 69.0 to DALE N 69.0 Circuit 1
line_1488	Line	Line DIXILETW 69.0 to JOMAX W 69.0 Circuit 1
line_1489	Line	Line DIXILETW 69.0 to DIXILETE 69.0 Circuit 1
line_1490	Line	Line DIXILETW 69.0 to CAVE CRK 69.0 Circuit 1
line_1491	Line	Line DOUBLTRS 69.0 to CENTURYW 69.0 Circuit 1
line_1492	Line	Line DOWNINGW 69.0 to DOWNINGC 69.0 Circuit 1
line_1493	Line	Line DOWNINGE 69.0 to EASTEN N 69.0 Circuit 1
line_1494	Line	Line DOWNINGC 69.0 to DOWNINGE 69.0 Circuit 1
line_1495	Line	Line DOWNINGC 69.0 to THOMPK W 69.0 Circuit 1
line_1496	Line	Line ALTADENW 69.0 to ALTADENE 69.0 Circuit 1
line_1497	Line	Line ALTADENE 69.0 to SHEA E 69.0 Circuit 1
line_1498	Line	Line CACTUS W 69.0 to RAINTREN 69.0 Circuit 1
line_1499	Line	Line PINNPK E 69.0 to RAWHIDEE 69.0 Circuit 1
line_1500	Line	Line PINNPK E 69.0 to GRNITRF 69.0 Circuit 1
line_1501	Line	Line PINNPK E 69.0 to PINPKEST 69.0 Circuit 1
line_1502	Line	Line PINNPK E 69.0 to PINNPK W 69.0 Circuit 1
line_1503	Line	Line CACTUS E 69.0 to SHEA W 69.0 Circuit 1
line_1504	Line	Line CACTUS E 69.0 to CACTUS C 69.0 Circuit 1
line_1505	Line	Line CACTUS E 69.0 to CHAPRALW 69.0 Circuit 1

2014 Single Contingency List (Category B)		
Contingency Number	**Type**	**Contingency Name**
line_1506	Line	Line PINNPK W 69.0 to JOMAX E 69.0 Circuit 1
line_1507	Line	Line PINNPK W 69.0 to BLVD E 69.0 Circuit 1
line_1508	Line	Line PINNPK W 69.0 to DSRTRDGW 69.0 Circuit 1
line_1509	Line	Line THOMPK W 69.0 to THOMPK E 69.0 Circuit 1
line_1510	Line	Line THOMPK E 69.0 to ALTADENW 69.0 Circuit 1
line_1511	Line	Line DSRTRDGW 69.0 to DSRTRDGE 69.0 Circuit 1
line_1512	Line	Line ROADRUNC 69.0 to ROADRUNS 69.0 Circuit 1
line_1513	Line	Line ROADRUNC 69.0 to ROADRUNN 69.0 Circuit 1
line_1514	Line	Line INDBENDE 69.0 to DESPRNGS 69.0 Circuit 1
line_1515	Line	Line CAMELBKC 69.0 to MUMMYMTE 69.0 Circuit 1
line_1516	Line	Line CAMELBKN 69.0 to CAMELBKC 69.0 Circuit 1
line_1517	Line	Line CAMELBKS 69.0 to MCORMCKE 69.0 Circuit 1
line_1518	Line	Line CAMELBKS 69.0 to CAMELBKC 69.0 Circuit 1
line_1519	Line	Line REACH 69.0 to DSRTRDGE 69.0 Circuit 1
line_1520	Line	Line INDBENDW 69.0 to INDBENDE 69.0 Circuit 1
line_1521	Line	Line STGCOACH 69.0 to DALE N 69.0 Circuit 1
line_1522	Line	Line EASTRNOF 69.0 to DESPRNGS 69.0 Circuit 1
line_1523	Line	Line PARADS W 69.0 to ROADRUNC 69.0 Circuit 1
line_1524	Line	Line PARADS E 69.0 to REACH 69.0 Circuit 1
line_1525	Line	Line PARADS E 69.0 to EASTRNOF 69.0 Circuit 1
line_1526	Line	Line PARADS E 69.0 to PARADS C 69.0 Circuit 1
line_1527	Line	Line PARADS C 69.0 to PARADS W 69.0 Circuit 1
line_1528	Line	Line EASTEN S 69.0 to ALTADENW 69.0 Circuit 1
line_1529	Line	Line EASTEN N 69.0 to EASTEN S 69.0 Circuit 1
line_1530	Line	Line CHAPRALW 69.0 to MCORMCKW 69.0 Circuit 1
line_1531	Line	Line CHAPRALW 69.0 to CHAPRALE 69.0 Circuit 1
line_1532	Line	Line CHAPRALE 69.0 to CENTURYE 69.0 Circuit 1
line_1533	Line	Line CENTURYE 69.0 to ACOMA E 69.0 Circuit 1
line_1534	Line	Line CLGRNDEW 69.0 to CLGRNDEE 69.0 Circuit 1
line_1535	Line	Line NVALLEYS 69.0 to CLGRNDEW 69.0 Circuit 1
line_1536	Line	Line NVALLEYS 69.0 to NVALLEYN 69.0 Circuit 1
line_1537	Line	Line HONYWLTP 69.0 to HONYWELS 69.0 Circuit 1
line_1538	Line	Line HONYWLTP 69.0 to CANAL C 69.0 Circuit 1
line_1539	Line	Line LOMAVSTE 69.0 to LOMAVSTW 69.0 Circuit 1
line_1540	Line	Line LOMAVSTE 69.0 to LVISTTAP 69.0 Circuit 1

2014 Single Contingency List (Category B)		
Contingency Number	**Type**	**Contingency Name**
line_1541	Line	Line UNIONHLE 69.0 to UNIONHLW 69.0 Circuit 1
line_1542	Line	Line UNIONHLE 69.0 to LOOKOUTN 69.0 Circuit 1
line_1543	Line	Line UNIONHLE 69.0 to TURF 69.0 Circuit 1
line_1544	Line	Line LVISTTAP 69.0 to HONYWLTP 69.0 Circuit 1
line_1545	Line	Line LVISTTAP 69.0 to HONYWELN 69.0 Circuit 1
line_1546	Line	Line CANAL C 69.0 to CANAL E 69.0 Circuit 1
line_1547	Line	Line CANAL C 69.0 to CANAL W 69.0 Circuit 1
line_1548	Line	Line LONEPK E 69.0 to PARADS C 69.0 Circuit 1
line_1549	Line	Line LONEPK E 69.0 to LONEPK W 69.0 Circuit 1
line_1550	Line	Line LONEPK E 69.0 to BUFFALOW 69.0 Circuit 1
line_1551	Line	Line LONEPK W 69.0 to UNIONHLW 69.0 Circuit 1
line_1552	Line	Line LONEPK W 69.0 to AQUEDUCW 69.0 Circuit 1
line_1553	Line	Line LOOKOUTN 69.0 to LOOKOUTS 69.0 Circuit 1
line_1554	Line	Line STOUT E 69.0 to STOUT W 69.0 Circuit 1
line_1555	Line	Line STOUT E 69.0 to ROSEGRDE 69.0 Circuit 1
line_1556	Line	Line LOOKOUTS 69.0 to MOONVALN 69.0 Circuit 1
line_1557	Line	Line CHERYL S 69.0 to CHERYL N 69.0 Circuit 1
line_1558	Line	Line ORANGWDE 69.0 to ORANGTAP 69.0 Circuit 1
line_1559	Line	Line ORANGWDE 69.0 to ORANGWDW 69.0 Circuit 1
line_1560	Line	Line ORANGWDC 69.0 to ORANGWDE 69.0 Circuit 1
line_1561	Line	Line ORANGWDC 69.0 to ORANGWDW 69.0 Circuit 1
line_1562	Line	Line ORANGTAP 69.0 to MUMMYMTW 69.0 Circuit 1
line_1563	Line	Line HONYWELN 69.0 to HONYWELS 69.0 Circuit 1
line_1564	Line	Line ARROYO W 69.0 to LOMAVSTW 69.0 Circuit 1
line_1565	Line	Line ROSEGRDE 69.0 to NVALLEYN 69.0 Circuit 1
line_1566	Line	Line ROSEGRDE 69.0 to ROSEGRDW 69.0 Circuit 1
line_1567	Line	Line SUNYSLPW 69.0 to ROADRUNN 69.0 Circuit 1
line_1568	Line	Line SUNYSLPW 69.0 to ALEXNDR 69.0 Circuit 1
line_1569	Line	Line ADOBE N 69.0 to STOUT W 69.0 Circuit 1
line_1570	Line	Line ADOBE N 69.0 to ADOBE S 69.0 Circuit 1
line_1571	Line	Line ADOBE N 69.0 to BSCTFLAT 69.0 Circuit 1
line_1572	Line	Line SKUNCRKS 69.0 to SKUNCRKN 69.0 Circuit 1
line_1573	Line	Line SKUNCRKS 69.0 to GRNBRR N 69.0 Circuit 1
line_1574	Line	Line YORKSHIR 69.0 to UNIONHLW 69.0 Circuit 1
line_1575	Line	Line DEERVALC 69.0 to DEERVALW 69.0 Circuit 1

2014 Single Contingency List (Category B)		
Contingency Number	**Type**	**Contingency Name**
line_1576	Line	Line ALEXNDR 69.0 to CANAL E 69.0 Circuit 2
line_1577	Line	Line ALEXNDR 69.0 to CANAL W 69.0 Circuit 1
line_1578	Line	Line ALEXNDR 69.0 to CHERYL S 69.0 Circuit 1
line_1579	Line	Line BUFFALOE 69.0 to REACH 69.0 Circuit 1
line_1580	Line	Line BUFFALOE 69.0 to BUFFALOW 69.0 Circuit 1
line_1581	Line	Line GRNBRR N 69.0 to GRNBRR S 69.0 Circuit 1
line_1582	Line	Line GRNBRR N 69.0 to GRENWAYW 69.0 Circuit 1
line_1583	Line	Line GRISWLD 69.0 to ORANGWDC 69.0 Circuit 1
line_1584	Line	Line GRENWAYW 69.0 to GRENWAYC 69.0 Circuit 1
line_1585	Line	Line GRENWAYE 69.0 to LOMAVSTW 69.0 Circuit 1
line_1586	Line	Line GRENWAYC 69.0 to GRENWAYE 69.0 Circuit 1
line_1587	Line	Line SUNYSLPE 69.0 to SUNYSLPW 69.0 Circuit 1
line_1588	Line	Line SUNYSLPE 69.0 to GRISWLD 69.0 Circuit 1
line_1589	Line	Line SUNYSLPE 69.0 to SHAW N 69.0 Circuit 1
line_1590	Line	Line MONTECRN 69.0 to MONTECRS 69.0 Circuit 1
line_1591	Line	Line MONTECRS 69.0 to LOMAVSTE 69.0 Circuit 1
line_1592	Line	Line MOONVALS 69.0 to SUNYSLPW 69.0 Circuit 1
line_1593	Line	Line MOONVALS 69.0 to MOONVALN 69.0 Circuit 1
line_1594	Line	Line SHAW S 69.0 to CHERYL N 69.0 Circuit 1
line_1595	Line	Line SHAW S 69.0 to SHAW N 69.0 Circuit 1
line_1596	Line	Line AQUEDUCE 69.0 to CLGRNDEW 69.0 Circuit 1
line_1597	Line	Line AQUEDUCE 69.0 to AQUEDUCW 69.0 Circuit 1
line_1598	Line	Line DEERVALW 69.0 to TURF 69.0 Circuit 1
line_1599	Line	Line DEERVALW 69.0 to ADOBE S 69.0 Circuit 1
line_1600	Line	Line DEERVALW 69.0 to SKUNCRKN 69.0 Circuit 1
line_1601	Line	Line DEERVALE 69.0 to ROSEGRDW 69.0 Circuit 1
line_1602	Line	Line DEERVALE 69.0 to YORKSHIR 69.0 Circuit 1
line_1603	Line	Line DEERVALE 69.0 to DEERVALC 69.0 Circuit 1
line_1604	Line	Line DEERVALE 69.0 to MONTECRN 69.0 Circuit 1
line_1605	Line	Line HUMBUG 69.0 to LAKESIDE 69.0 Circuit 1
line_1606	Line	Line RACEWAY 69.0 to HUMBUG 69.0 Circuit 1
line_1607	Line	Line RACEWAY 69.0 to PYRMID W 69.0 Circuit 1
line_1608	Line	Line RACEWAY 69.0 to CLDRWD 69.0 Circuit 1
line_1609	Line	Line DOVEVLYN 69.0 to DOVEVLYS 69.0 Circuit 1
line_1610	Line	Line HUMBUGTP 69.0 to NEWRVR S 69.0 Circuit 1

2014 Single Contingency List (Category B)		
Contingency Number	**Type**	**Contingency Name**
line_1611	Line	Line GAVILNPK 69.0 to DOVEVLYN 69.0 Circuit 1
line_1612	Line	Line GAVILNPK 69.0 to NEWRVR N 69.0 Circuit 1
line_1613	Line	Line PIONEERW 69.0 to PIONEERE 69.0 Circuit 1
line_1614	Line	Line NEWRVR N 69.0 to WLDBURRO 69.0 Circuit 1
line_1615	Line	Line NEWRVR S 69.0 to NEWRVR N 69.0 Circuit 1
line_1616	Line	Line DEADMNWN 69.0 to NEWRVR S 69.0 Circuit 1
line_1617	Line	Line DEADMNWN 69.0 to DEADMNWS 69.0 Circuit 1
line_1618	Line	Line LAKESIDE 69.0 to HUMBUGTP 69.0 Circuit 1
line_1619	Line	Line HDGPETHE 69.0 to PYRMID W 69.0 Circuit 1
line_1620	Line	Line HDGPETHW 69.0 to HDGPETHE 69.0 Circuit 1
line_1621	Line	Line CLINIC E 69.0 to CLINIC W 69.0 Circuit 1
line_1622	Line	Line WLDBURRO 69.0 to ROCKSPNG 69.0 Circuit 1
line_1623	Line	Line BSCTFLAT 69.0 to GATEWAYW 69.0 Circuit 1
line_1624	Line	Line GATEWAYW 69.0 to PIONEERW 69.0 Circuit 1
line_1625	Line	Line PYRMID W 69.0 to BSCTFLAT 69.0 Circuit 1
line_1626	Line	Line ROCKSPNG 69.0 to SYCAMOR 69.0 Circuit 1
line_1627	Line	Line PIONEERE 69.0 to DEADMNWS 69.0 Circuit 1
line_1628	Line	Line PEORIA E 69.0 to AFRAAPSS 69.0 Circuit 1
line_1629	Line	Line PLEASANT 69.0 to ARROWHDE 69.0 Circuit 1
line_1630	Line	Line WESTWING 69.0 to CLDRWD 69.0 Circuit 1
line_1631	Line	Line WESTWING 69.0 to WESTBRKW 69.0 Circuit 1
line_1632	Line	Line WESTWING 69.0 to HVT 69.0 Circuit 1
line_1633	Line	Line WESTWING 69.0 to RIOVISTE 69.0 Circuit 1
line_1634	Line	Line MARINETN 69.0 to MARINETS 69.0 Circuit 1
line_1635	Line	Line DYSART W 69.0 to HEARNTAP 69.0 Circuit 1
line_1636	Line	Line DYSART W 69.0 to DYSART C 69.0 Circuit 1
line_1637	Line	Line STARDSTE 69.0 to STARDSTW 69.0 Circuit 1
line_1638	Line	Line ARROWHDW 69.0 to ARROWHDE 69.0 Circuit 1
line_1639	Line	Line DYSARTTP 69.0 to LUKFLDTP 69.0 Circuit 1
line_1640	Line	Line DYSARTTP 69.0 to LUKEFELD 69.0 Circuit 1
line_1641	Line	Line LUKFLDTP 69.0 to LUKEFELD 69.0 Circuit 1
line_1642	Line	Line HEARN E 69.0 to HEARN W 69.0 Circuit 1
line_1643	Line	Line HEARN E 69.0 to JAVELINS 69.0 Circuit 1
line_1644	Line	Line WADDELL 69.0 to WDL TAP 69.0 Circuit 1
line_1645	Line	Line BELL N 69.0 to PLEASANT 69.0 Circuit 1

2014 Single Contingency List (Category B)		
Contingency Number	**Type**	**Contingency Name**
line_1646	Line	Line BELL N 69.0 to MTNVIEWE 69.0 Circuit 1
line_1647	Line	Line GLNDTAP 69.0 to LUKFLDTP 69.0 Circuit 1
line_1648	Line	Line MERIDTAP 69.0 to GLNDTAP 69.0 Circuit 1
line_1649	Line	Line AFRAAPSN 69.0 to ARROYO W 69.0 Circuit 1
line_1650	Line	Line AFRAAPSN 69.0 to AFRAAPSS 69.0 Circuit 1
line_1651	Line	Line AFRAAPSS 69.0 to GLNDTAP 69.0 Circuit 1
line_1652	Line	Line JAVELINN 69.0 to JAVELINS 69.0 Circuit 1
line_1653	Line	Line HEARNTAP 69.0 to HEARN W 69.0 Circuit 1
line_1654	Line	Line MCMICKNE 69.0 to PATTONTP 69.0 Circuit 1
line_1655	Line	Line MCMICKNW 69.0 to WESTWING 69.0 Circuit 1
line_1656	Line	Line MCMICKNW 69.0 to MCMICKNE 69.0 Circuit 1
line_1657	Line	Line DELRIO W 69.0 to PEORIA W 69.0 Circuit 1
line_1658	Line	Line DELRIO W 69.0 to BELL S 69.0 Circuit 1
line_1659	Line	Line WESTBRKW 69.0 to WESTBRKE 69.0 Circuit 1
line_1660	Line	Line EL SOLMN 69.0 to MARINTAP 69.0 Circuit 1
line_1661	Line	Line EL SOLMN 69.0 to MTNVIEWW 69.0 Circuit 1
line_1662	Line	Line EL SOLMS 69.0 to MARINETS 69.0 Circuit 1
line_1663	Line	Line EL SOLMS 69.0 to MERIDTAP 69.0 Circuit 1
line_1664	Line	Line EL SOLMS 69.0 to EL SOLMN 69.0 Circuit 1
line_1665	Line	Line EL SOLMS 69.0 to OLIVEAPS 69.0 Circuit 1
line_1666	Line	Line EL SOLMS 69.0 to WDL TAP 69.0 Circuit 1
line_1667	Line	Line FRT 69.0 to SNVLY 69.0 Circuit 1
line_1668	Line	Line WESTBRKE 69.0 to ARROWHDW 69.0 Circuit 1
line_1669	Line	Line PEORIA W 69.0 to PEORIA E 69.0 Circuit 1
line_1670	Line	Line SURPRISC 69.0 to STARDSTE 69.0 Circuit 1
line_1671	Line	Line SURPRISC 69.0 to BDSLYTP1 69.0 Circuit 1
line_1672	Line	Line SURPRISC 69.0 to SURPRISS 69.0 Circuit 1
line_1673	Line	Line SURPRISN 69.0 to SURPRISC 69.0 Circuit 1
line_1674	Line	Line SURPRISN 69.0 to RIOVISTE 69.0 Circuit 1
line_1675	Line	Line SURPRISN 69.0 to SPNGARDS 69.0 Circuit 1
line_1676	Line	Line HATFELD 69.0 to HDGPETHW 69.0 Circuit 1
line_1677	Line	Line MARINTAP 69.0 to MARINETS 69.0 Circuit 1
line_1678	Line	Line MARINTAP 69.0 to DYSART E 69.0 Circuit 1
line_1679	Line	Line BDSLYTP1 69.0 to BEARDSLY 69.0 Circuit 1
line_1680	Line	Line BDSLYTP1 69.0 to MCMICKNE 69.0 Circuit 1

2014 Single Contingency List (Category B)		
Contingency Number	**Type**	**Contingency Name**
line_1681	Line	Line HVT 69.0 to HATFELD 69.0 Circuit 1
line_1682	Line	Line SURPRISS 69.0 to JAVELINN 69.0 Circuit 1
line_1683	Line	Line SURPRISS 69.0 to DYSART C 69.0 Circuit 1
line_1684	Line	Line RIOVISTW 69.0 to RIOVISTE 69.0 Circuit 1
line_1685	Line	Line MTNVIEWE 69.0 to MTNVIEWW 69.0 Circuit 1
line_1686	Line	Line MTNVIEWW 69.0 to RIOVISTW 69.0 Circuit 1
line_1687	Line	Line DYSART E 69.0 to VARNEY E 69.0 Circuit 1
line_1688	Line	Line OLIVEAPS 69.0 to MARINETN 69.0 Circuit 1
line_1689	Line	Line OLIVEAPS 69.0 to AFRAAPSS 69.0 Circuit 1
line_1690	Line	Line BELL S 69.0 to GRNBRR S 69.0 Circuit 1
line_1691	Line	Line BELL S 69.0 to BELL N 69.0 Circuit 1
line_1692	Line	Line DYSART C 69.0 to DYSART E 69.0 Circuit 1
line_1693	Line	Line STARDSTW 69.0 to SPNGARDN 69.0 Circuit 1
line_1694	Line	Line WDL TAP 69.0 to HEARNTAP 69.0 Circuit 1
line_1695	Line	Line VARNEY E 69.0 to DYSARTTP 69.0 Circuit 1
line_1696	Line	Line SPNGARDS 69.0 to SPNGARDN 69.0 Circuit 1
line_1697	Line	Line WHTNKAPN 69.0 to WS99 69.0 Circuit 1
line_1698	Line	Line WS99 69.0 to SARIVALS 69.0 Circuit 1
line_1699	Line	Line WHTNKAPN 69.0 to LITCHFDE 69.0 Circuit 1
line_1700	Line	Line COLTER N 69.0 to AFRAAPSS 69.0 Circuit 1
line_1701	Line	Line COLTER N 69.0 to COLTER S 69.0 Circuit 1
line_1702	Line	Line SEDELLA 69.0 to PLMVLY 69.0 Circuit 1
line_1703	Line	Line SARIVALS 69.0 to BRADLEY 69.0 Circuit 1
line_1704	Line	Line SARIVALN 69.0 to SARIVALS 69.0 Circuit 1
line_1705	Line	Line PIMA S 69.0 to PLMVLY 69.0 Circuit 1
line_1706	Line	Line PIMA 69.0 to PIMA S 69.0 Circuit 1
line_1707	Line	Line PIMA 69.0 to PEBCRK W 69.0 Circuit 1
line_1708	Line	Line WS3 TAP 69.0 to SEDELLA 69.0 Circuit 1
line_1709	Line	Line WS3 TAP 69.0 to COTBUKTP 69.0 Circuit 1
line_1710	Line	Line BRADLEY 69.0 to ESTRLLTA 69.0 Circuit 1
line_1711	Line	Line LITCHFDE 69.0 to LITCHFDW 69.0 Circuit 1
line_1712	Line	Line WHTNKAPS 69.0 to WHTNKAPN 69.0 Circuit 1
line_1713	Line	Line WHTNKAPS 69.0 to COLTER S 69.0 Circuit 1
line_1714	Line	Line WHTNKAPS 69.0 to COLDWTRE 69.0 Circuit 1
line_1715	Line	Line COTBUKTP 69.0 to PLMVLY 69.0 Circuit 1

2014 Single Contingency List (Category B)		
Contingency Number	**Type**	**Contingency Name**
line_1716	Line	Line COTBUKTP 69.0 to COTPERTP 69.0 Circuit 1
line_1717	Line	Line COTPERTP 69.0 to SARIVALN 69.0 Circuit 1
line_1718	Line	Line COLDWTRW 69.0 to BULARD N 69.0 Circuit 1
line_1719	Line	Line WLDFLWRN 69.0 to SARIVALN 69.0 Circuit 1
line_1720	Line	Line WLDFLWRN 69.0 to WLDFLWRS 69.0 Circuit 1
line_1721	Line	Line COLDWTRE 69.0 to COLDWTRW 69.0 Circuit 1
line_1722	Line	Line BULARD N 69.0 to WLDFLWRS 69.0 Circuit 1
line_1723	Line	Line PEBCRK E 69.0 to LITCHFDW 69.0 Circuit 1
line_1724	Line	Line PEBCRK E 69.0 to PEBCRK W 69.0 Circuit 1
line_1725	Line	Line BUCKEYE 69.0 to WATSON W 69.0 Circuit 1
line_1726	Line	Line BUCKEYE 69.0 to TRT TEMP 69.0 Circuit 1
line_1727	Line	Line BUCKEYE 69.0 to ROBBINBT 69.0 Circuit 1
line_1728	Line	Line BUCKEYE 69.0 to K685-GP 69.0 Circuit 1
line_1729	Line	Line BUCKEYE 69.0 to SV4 69.0 Circuit 1
line_1730	Line	Line WATSON E 69.0 to WATSON W 69.0 Circuit 1
line_1731	Line	Line PERRYVIL 69.0 to COTPERTP 69.0 Circuit 1
line_1732	Line	Line TUTHIL S 69.0 to WATSON E 69.0 Circuit 1
line_1733	Line	Line TUTHIL N 69.0 to WS3 TAP 69.0 Circuit 1
line_1734	Line	Line TUTHIL N 69.0 to TUTHIL S 69.0 Circuit 1
line_1735	Line	Line AZTECTAP 69.0 to AZTEC 69.0 Circuit 1
line_1736	Line	Line AZTECTAP 69.0 to HORN 69.0 Circuit 1
line_1737	Line	Line BUNYAN 69.0 to CNTYLN 69.0 Circuit 1
line_1738	Line	Line HARQUATP 69.0 to HARQUAHA 69.0 Circuit 1
line_1739	Line	Line HARQUATP 69.0 to SADDLEMT 69.0 Circuit 1
line_1740	Line	Line BASELIN 69.0 to PVNGPUMP 69.0 Circuit 1
line_1741	Line	Line TRT TEMP 69.0 to DSRTSKY 69.0 Circuit 1
line_1742	Line	Line ROBBINBT 69.0 to RAINBWTP 69.0 Circuit 1
line_1743	Line	Line PERYVLTP 69.0 to WATSON W 69.0 Circuit 1
line_1744	Line	Line PERYVLTP 69.0 to PERRYVIL 69.0 Circuit 1
line_1745	Line	Line GILABEND 69.0 to PALOMA 69.0 Circuit 1
line_1746	Line	Line GILABEND 69.0 to THAYERAP 69.0 Circuit 1
line_1747	Line	Line K685-GP 69.0 to ROBBINBT 69.0 Circuit 1
line_1748	Line	Line K685-BZ 69.0 to BASELIN 69.0 Circuit 1
line_1749	Line	Line K685-BZ 69.0 to K685-GP 69.0 Circuit 1
line_1750	Line	Line PALOMA 69.0 to BUNYAN 69.0 Circuit 1

2014 Single Contingency List (Category B)		
Contingency Number	**Type**	**Contingency Name**
line_1751	Line	Line PHILPSAZ 69.0 to WINTRBRG 69.0 Circuit 1
line_1752	Line	Line PHILPSAZ 69.0 to TONOPAH1 69.0 Circuit 1
line_1753	Line	Line THAYERAP 69.0 to AJO TAP 69.0 Circuit 1
line_1754	Line	Line WINTERTP 69.0 to WINTRBRG 69.0 Circuit 1
line_1755	Line	Line WINTERTP 69.0 to ARLNGTON 69.0 Circuit 1
line_1756	Line	Line WINTERTP 69.0 to PVNGPUMP 69.0 Circuit 1
line_1757	Line	Line DARBY 69.0 to DARBYTAP 69.0 Circuit 1
line_1758	Line	Line DARBYTAP 69.0 to AIC TAP 69.0 Circuit 1
line_1759	Line	Line AJO TAP 69.0 to AIC TAP 69.0 Circuit 1
line_1760	Line	Line AJO 69.0 to WHY 69.0 Circuit 1
line_1761	Line	Line AJO 69.0 to AJO TAP 69.0 Circuit 1
line_1762	Line	Line CNTYLN 69.0 to HYDERTAP 69.0 Circuit 1
line_1763	Line	Line PVNGPUMP 69.0 to GILLWEST 69.0 Circuit 1
line_1764	Line	Line DSRTSKY 69.0 to PHILPSAZ 69.0 Circuit 1
line_1765	Line	Line HYDERTAP 69.0 to AZTECTAP 69.0 Circuit 1
line_1766	Line	Line HYDERTAP 69.0 to HYDER 69.0 Circuit 1
line_1767	Line	Line VALNCIA 69.0 to BASELIN 69.0 Circuit 1
line_1768	Line	Line VALNCIA 69.0 to PERYVLTP 69.0 Circuit 1
line_1769	Line	Line VALNCIA 69.0 to K685-BZ 69.0 Circuit 1
line_1770	Line	Line AIC 69.0 to DARBYTAP 69.0 Circuit 1
line_1771	Line	Line AIC TAP 69.0 to WHY 69.0 Circuit 1
line_1772	Line	Line COTN CTR 69.0 to GILABEND 69.0 Circuit 1
line_1773	Line	Line SADDLEMT 69.0 to CNTYLN 69.0 Circuit 1
line_1774	Line	Line GILLESPI 69.0 to PATTERSN 69.0 Circuit 1
line_1775	Line	Line GILLESPI 69.0 to GILLWEST 69.0 Circuit 1
line_1776	Line	Line GILLESPI 69.0 to COTN CTR 69.0 Circuit 1
line_1777	Line	Line TONOPAH1 69.0 to HARQUATP 69.0 Circuit 1
line_1778	Line	Line RAINBWTP 69.0 to PATTERSN 69.0 Circuit 1
line_1779	Line	Line RAINBWTP 69.0 to RNBOWVLY 69.0 Circuit 1
line_1780	Line	Line PAPAGOBT 69.0 to PAPGOAPW 69.0 Circuit 1
line_1781	Line	Line WHTNKAPS 69.0 to WHITETNK 69.0 Circuit 1
line_1782	Line	Line AF-STEAM 69.0 to AFRAAPSN 69.0 Circuit 1
line_1783	Line	Line AF-STEAM 69.0 to AFRAAPSS 69.0 Circuit 1
line_1784	Line	Line ORANGTAP 69.0 to SQUAWTAP 69.0 Circuit 1
line_1785	Line	Line KYRENEGT 69.0 to OMEGA 69.0 Circuit 1

2014 Single Contingency List (Category B)		
Contingency Number	**Type**	**Contingency Name**
line_1786	Line	Line RIVIERA 69.0 to BIG BEND 69.0 Circuit 1
line_1787	Line	Line RIVIERA 69.0 to CMPMOHAV 69.0 Circuit 1
line_1788	Line	Line RIVIERA 69.0 to SLCRKTAP 69.0 Circuit 1
line_1789	Line	Line RED TAIL 69.0 to CIRCLE_I 69.0 Circuit 1
line_1790	Line	Line TOPOCK 69.0 to SWAN 69.0 Circuit 1
line_1791	Line	Line FREEMAN 69.0 to SAFFORD 69.0 Circuit 1
line_1792	Line	Line SAFFTAP2 69.0 to SAFFORD 69.0 Circuit 2
line_1793	Line	Line AIRPORT 69.0 to RIVIERA 69.0 Circuit 1
line_1794	Line	Line B.WILAMS 69.0 to WELFLDTP 69.0 Circuit 1
line_1795	Line	Line CMPMOHAV 69.0 to WILVALTP 69.0 Circuit 1
line_1796	Line	Line SLCRKTAP 69.0 to MEDLIN 69.0 Circuit 1
line_1797	Line	Line SLCRKTAP 69.0 to SILVRCRK 69.0 Circuit 1
line_1798	Line	Line WELFIELD 69.0 to NATCORAL 69.0 Circuit 1
line_1799	Line	Line WILVALTP 69.0 to SWAN 69.0 Circuit 1
line_1800	Line	Line WILVALTP 69.0 to WILLOWVY 69.0 Circuit 1
line_1801	Line	Line WELFLDTP 69.0 to WELFIELD 69.0 Circuit 1
line_1802	Line	Line WELFLDTP 69.0 to OCB001 69.0 Circuit 1
line_1803	Line	Line STEWRTTP 69.0 to HOOKERTP 69.0 Circuit 1
line_1804	Line	Line STEWRTTP 69.0 to MORTENSN 69.0 Circuit 1
line_1805	Line	Line CIRCLE_I 69.0 to STEWART 69.0 Circuit 1
line_1806	Line	Line RAMSEY 69.0 to HEREFORD 69.0 Circuit 1
line_1807	Line	Line GARDENSW 69.0 to RAMSEY 69.0 Circuit 1
line_1808	Line	Line STEWART 69.0 to STEWRTTP 69.0 Circuit 1
line_1809	Line	Line S.CRUZJT 69.0 to ALAMO 69.0 Circuit 1
line_1810	Line	Line ROUNDVLY 69.0 to NELSON 69.0 Circuit 1
line_1811	Line	Line PLANETTP 69.0 to B.WILAMS 69.0 Circuit 1
line_1812	Line	Line DAVIS 69.0 to AIRPORT 69.0 Circuit 1
line_1813	Line	Line HARCUVAR 230.0 to HARCU AZ 230.0 Circuit 1
line_1814	Line	Line HASSYTAP 230.0 to HASSY AZ 230.0 Circuit 1
line_1815	Line	Line BRADY 115.0 to BRADYAZ 115.0 Circuit 1
line_1816	Line	Line PICACHOW 115.0 to PICACHAZ 115.0 Circuit 1
line_1817	Line	Line RED ROCK 115.0 to REDRCKAZ 115.0 Circuit 1
line_1818	Line	Line TWINPEAK 115.0 to TWINPKAZ 115.0 Circuit 1
line_1819	Line	Line BRAWLEY 115.0 to BRAWLYAZ 115.0 Circuit 1
line_1820	Line	Line SANDARIO 115.0 to SANDARAZ 115.0 Circuit 1

2014 Single Contingency List (Category B)		
Contingency Number	**Type**	**Contingency Name**
line_1821	Line	Line SANXAVER 115.0 to SANXAVAZ 115.0 Circuit 1
line_1822	Line	Line BLACKMTN 115.0 to BLKMTNAZ 115.0 Circuit 1
line_1823	Line	Line SNYDHILL 115.0 to SNYDHLAZ 115.0 Circuit 1
line_1824	Line	Line FLAGSTAF 345.0 to YOUNGSCY 345.0 Circuit 1
line_1825	Line	Line DSRTSKY 69.0 to BADGER 69.0 Circuit 1
line_1826	Line	Line BADGER 69.0 to PHILPSAZ 69.0 Circuit 1
line_1827	Line	Line MCMICKNW 69.0 to FARMERTP 69.0 Circuit 1
line_1828	Line	Line FARMERTP 69.0 to FRT 69.0 Circuit 1
line_1829	Line	Line FARMERTP 69.0 to FARMERAP 69.0 Circuit 1
line_1830	Line	Line EASTEN S 69.0 to RAINTREN 69.0 Circuit 1
line_1831	Line	Line ESTRLLTA 69.0 to WILLISAZ 69.0 Circuit 1
line_1832	Line	Line GATEWAYW 69.0 to GAVILNPK 69.0 Circuit 1
line_1833	Line	Line VLYFARMS 69.0 to SE6 69.0 Circuit 1
line_1834	Line	Line SE6 69.0 to MERRIL 69.0 Circuit 1
line_1835	Line	Line NILAND 161.0 to BLYTHE 161.0 Circuit 1
line_1836	Line	Line KNOB 161.0 to PILOTKNB 161.0 Circuit 1
line_1837	Line	Line CTRYCLBC 69.0 to CHURCH E 69.0 Circuit 2
line_1838	Line	Line HASSYAMP 500.0 to AVSOLAR 500.0 Circuit 1
line_1839	Line	Line AVSOLAR 115.0 to AVSOLAR2 115.0 Circuit 1
line_1840	Line	Line N.GILA 69.0 to DSRTSND 69.0 Circuit 1
line_1841	Line	Line DSRTSND 69.0 to FOOTHILS 69.0 Circuit 1
line_1842	Line	Line YUCCA161 161.0 to PILOTKNB 161.0 Circuit 1
line_1843	Line	Line CVSUB92 92.0 to COACHELLASW 92.0 Circuit 1
line_1844	Line	Line CVSUB92 92.0 to COACHELLASW 92.0 Circuit 2
line_1845	Line	Line CVSUB92 92.0 to NEW_JACKSON 92.0 Circuit 1
line_1846	Line	Line CVSUB92 92.0 to DESERT_VIEW 92.0 Circuit 1
line_1847	Line	Line AVE58 92.0 to JEFFERSON 92.0 Circuit 1
line_1848	Line	Line AVE58 92.0 to RTAP8 92.0 Circuit 1
line_1849	Line	Line AVE58 92.0 to RTP6OASS 92.0 Circuit 1
line_1850	Line	Line USNAF 92.0 to DIXIELAN 92.0 Circuit 1
line_1851	Line	Line USNAF 92.0 to TERMINAL 92.0 Circuit 1
line_1852	Line	Line JEFFERSON 92.0 to MARSHALL 92.0 Circuit 1
line_1853	Line	Line LAQUINTA 92.0 to N.LAQUINTA 92.0 Circuit 1
line_1854	Line	Line LAQUINTA 92.0 to MARSHALL 92.0 Circuit 1
line_1855	Line	Line RTAP8 92.0 to COACHELLASW 92.0 Circuit 1

2014 Single Contingency List (Category B)		
Contingency Number	**Type**	**Contingency Name**
line_1856	Line	Line N.VIEW 92.0 to AVE42 92.0 Circuit 1
line_1857	Line	Line N.VIEW 92.0 to RAMON92 92.0 Circuit 1
line_1858	Line	Line AVE48 92.0 to CWTAP2 92.0 Circuit 1
line_1859	Line	Line N.LAQUINTA 92.0 to AVE42 92.0 Circuit 1
line_1860	Line	Line BOMBAY 92.0 to NORTHSHR 92.0 Circuit 1
line_1861	Line	Line CITAP1 92.0 to COACHELLASW 92.0 Circuit 1
line_1862	Line	Line CITAP1 92.0 to VANBUREN 92.0 Circuit 1
line_1863	Line	Line CARREON 92.0 to CITP4 92.0 Circuit 1
line_1864	Line	Line CARREON 92.0 to MONROE 92.0 Circuit 1
line_1865	Line	Line SKY VLY 92.0 to CMTAP1 92.0 Circuit 1
line_1866	Line	Line CITP2 92.0 to CITP4 92.0 Circuit 1
line_1867	Line	Line CITP2 92.0 to NEW_JACKSON 92.0 Circuit 1
line_1868	Line	Line CMTAP1 92.0 to COACHELLASW 92.0 Circuit 1
line_1869	Line	Line CMTAP2 92.0 to VANBUREN 92.0 Circuit 1
line_1870	Line	Line AVE42 92.0 to SHIELDS 92.0 Circuit 1
line_1871	Line	Line AVE42 92.0 to FRANWAY 92.0 Circuit 1
line_1872	Line	Line FRANWAY 92.0 to EDOM 92.0 Circuit 1
line_1873	Line	Line AVE42 92.0 to MONROE 92.0 Circuit 1
line_1874	Line	Line CVSUB230 230.0 to RAMON 230.0 Circuit 1
line_1875	Line	Line CVSUB230 230.0 to MIDWAY 230.0 Circuit 1
line_1876	Line	Line CVSUB230 230.0 to MIDWAY 230.0 Circuit 2
line_1877	Line	Line MIDWAY 230.0 to HUDSONR 230.0 Circuit 1
line_1878	Line	Line CVSUB230 230.0 to MIRAGE 230.0 Circuit 1
line_1879	Line	Line COACHELLASW 92.0 to AVE52 92.0 Circuit 1
line_1880	Line	Line DIXIELAN 92.0 to DIXPRI2 92.0 Circuit 1
line_1881	Line	Line DIXIELAN 92.0 to RTP1 92.0 Circuit 1
line_1882	Line	Line DROP2 92.0 to DROP4 92.0 Circuit 1
line_1883	Line	Line DROP3 92.0 to DROP4 92.0 Circuit 1
line_1884	Line	Line DROP4 92.0 to BRAVO 92.0 Circuit 1
line_1885	Line	Line DROP4 92.0 to PILOTKNB 92.0 Circuit 1
line_1886	Line	Line DROP4 92.0 to ORMAT92 92.0 Circuit 1
line_1887	Line	Line EDOM 92.0 to RAMON92 92.0 Circuit 1
line_1888	Line	Line ELCENTSW 161.0 to PILOTKNB 161.0 Circuit 1
line_1889	Line	Line ELCENTSW 230.0 to IMPRLVLY 230.0 Circuit 1
line_1890	Line	Line ELSTEAMP 92.0 to TERMINAL 92.0 Circuit 1

2014 Single Contingency List (Category B)		
Contingency Number	**Type**	**Contingency Name**
line_1891	Line	Line ELSTEAMP 92.0 to TERMINAL 92.0 Circuit 2
line_1892	Line	Line ELSTEAMP 92.0 to HEBER 92.0 Circuit 1
line_1893	Line	Line HEBER 92.0 to HEBERSCE 92.0 Circuit 1
line_1894	Line	Line ELSTEAMP 92.0 to HOLTVILLE 92.0 Circuit 1
line_1895	Line	Line ELSTEAMP 92.0 to CLARK 92.0 Circuit 1
line_1896	Line	Line ELSTEAMP 92.0 to ORMAT92 92.0 Circuit 1
line_1897	Line	Line ELSTEAMP 92.0 to WSTBIOTP 92.0 Circuit 2
line_1898	Line	Line ELSTEAMP 92.0 to ATEN 92.0 Circuit 1
line_1899	Line	Line ELSTEAMP 92.0 to NEW_IMPERIAL 92.0 Circuit 1
line_1900	Line	Line ELSTEAMP 92.0 to CENTRAL 92.0 Circuit 1
line_1901	Line	Line TERMINAL 92.0 to EUCLID 92.0 Circuit 1
line_1902	Line	Line EUCLID 92.0 to DAHLIA 92.0 Circuit 1
line_1903	Line	Line HEBERSCE 92.0 to PERRY 92.0 Circuit 1
line_1904	Line	Line HOLTVILLE 92.0 to ATEN 92.0 Circuit 1
line_1905	Line	Line CLARK 92.0 to DAHLIA 92.0 Circuit 1
line_1906	Line	Line NEW_MECCA 92.0 to NORTHSHR 92.0 Circuit 1
line_1907	Line	Line NEW_MECCA 92.0 to KTP2 92.0 Circuit 1
line_1908	Line	Line AVE52 92.0 to THERMAL 92.0 Circuit 1
line_1909	Line	Line NILAND 161.0 to CVSUB161 161.0 Circuit 1
line_1910	Line	Line NILAND 161.0 to BLYTHE 161.0 Circuit 1
line_1911	Line	Line BRAVO 92.0 to PERRY 92.0 Circuit 1
line_1912	Line	Line BRAVO 92.0 to CLX92 92.0 Circuit 1
line_1913	Line	Line NILTAP92 92.0 to PRITP1 92.0 Circuit 1
line_1914	Line	Line NILAND 92.0 to NILTAP92 92.0 Circuit 1
line_1915	Line	Line OASIS 92.0 to RTP6OASS 92.0 Circuit 1
line_1916	Line	Line OASIS 92.0 to KTP2 92.0 Circuit 1
line_1917	Line	Line PERRY 92.0 to PRUETT 92.0 Circuit 1
line_1918	Line	Line DESRTPWR 92.0 to UNIT5 92.0 Circuit 1
line_1919	Line	Line ROCKWOOD 92.0 to WSTBIOTP 92.0 Circuit 2
line_1920	Line	Line ROCKWOOD 92.0 to BRAW92 92.0 Circuit 1
line_1921	Line	Line DIXPRI1 92.0 to CENTRAL 92.0 Circuit 1
line_1922	Line	Line RTAP2 92.0 to RTP3ANZA 92.0 Circuit 1
line_1923	Line	Line RTAP2 92.0 to SANFELIP 92.0 Circuit 1
line_1924	Line	Line RTAP2 92.0 to RTP1 92.0 Circuit 1
line_1925	Line	Line RTP3ANZA 92.0 to RTP4SLTN 92.0 Circuit 1

2014 Single Contingency List (Category B)		
Contingency Number	**Type**	**Contingency Name**
line_1926	Line	Line RTP4SLTN 92.0 to RTP5DSTS 92.0 Circuit 1
line_1927	Line	Line RTP5DSTS 92.0 to RTP6OASS 92.0 Circuit 1
line_1928	Line	Line THERMAL 92.0 to KTP2 92.0 Circuit 1
line_1929	Line	Line CLX92 92.0 to MALL 92.0 Circuit 1
line_1930	Line	Line ELSTEAMP 92.0 to MALL 92.0 Circuit 1
line_1931	Line	Line CALPTTAP 92.0 to CALIPAT 92.0 Circuit 1
line_1932	Line	Line CALPTTAP 92.0 to PRITP2 92.0 Circuit 1
line_1933	Line	Line HL1TAP 92.0 to HIGHLINE 92.0 Circuit 1
line_1934	Line	Line JJELMORE 92.0 to LEATHERS 92.0 Circuit 1
line_1935	Line	Line JJELMORE 92.0 to DELRAN 92.0 Circuit 1
line_1936	Line	Line EARTHE2 92.0 to REG1EX 92.0 Circuit 1
line_1937	Line	Line EARTHE2 92.0 to VULCAN 92.0 Circuit 1
line_1938	Line	Line HIGHLINE 230.0 to MIDWAY 230.0 Circuit 1
line_1939	Line	Line HIGHLINE 230.0 to MIDWAY 230.0 Circuit 2
line_1940	Line	Line HIGHLINE 92.0 to GEM23 92.0 Circuit 2
line_1941	Line	Line RAMON 230.0 to MIRAGE 230.0 Circuit 1
line_1942	Line	Line CALIPAT 92.0 to CALTP2 92.0 Circuit 1
line_1943	Line	Line MIDWAY 92.0 to MINPLNT 92.0 Circuit 1
line_1944	Line	Line MIDWAY 92.0 to VULCAN 92.0 Circuit 1
line_1945	Line	Line MINPLNT 92.0 to UNIT5 92.0 Circuit 1
line_1946	Line	Line WSTBIOTP 92.0 to WESTBIO 92.0 Circuit 1
line_1947	Line	Line AVE58 161.0 to AVE58TP1 161.0 Circuit 1
line_1948	Line	Line AVE58 161.0 to AVE58TP2 161.0 Circuit 1
line_1949	Line	Line AVE58TP2 161.0 to CVSUB161 161.0 Circuit 1
line_1950	Line	Line PRITP1 92.0 to PRISON 92.0 Circuit 1
line_1951	Line	Line PRISON 92.0 to PRITP2 92.0 Circuit 1
line_1952	Line	Line GEM92 92.0 to GEM23 92.0 Circuit 2
line_1953	Line	Line GEM23 92.0 to ORM2 92.0 Circuit 2
line_1954	Line	Line ORM2 92.0 to ORM1 92.0 Circuit 2
line_1955	Line	Line CALTP2 92.0 to BEEFPLNT 92.0 Circuit 1
line_1956	Line	Line DIXPRI1 92.0 to DIXPRI 92.0 Circuit 1
line_1957	Line	Line DIXPRI 92.0 to DIXPRI2 92.0 Circuit 1
line_1958	Line	Line NEW_IMPERIAL 92.0 to PANNO 92.0 Circuit 1
line_1959	Line	Line BRAW92 92.0 to PARKVIEW 92.0 Circuit 1
line_1960	Line	Line BRAW92 92.0 to PANNO 92.0 Circuit 1

2014 Single Contingency List (Category B)		
Contingency Number	**Type**	**Contingency Name**
line_1961	Line	Line BRAW92 92.0 to BEEFPLNT 92.0 Circuit 1
line_1962	Line	Line KNOB 161.0 to PILOTKNB 161.0 Circuit 1
line_1963	Line	Line ELCENTSW 161.0 to NILAND 161.0 Circuit 1
line_1964	Line	Line ELCENTSW 161.0 to AVE58TP1 161.0 Circuit 1
line_1965	Line	Line AVE48 92.0 to AVE58 92.0 Circuit 1
line_1966	Line	Line CWTAP2 92.0 to SHIELDS 92.0 Circuit 1
line_1967	Line	Line ELSTEAMP 92.0 to PRUETTAP 92.0 Circuit 1
line_1968	Line	Line PRUETT 92.0 to PRUETTAP 92.0 Circuit 1
line_1969	Line	Line NILAND 92.0 to MW1TAP 92.0 Circuit 1
line_1970	Line	Line MW1TAP 92.0 to MIDWAY 92.0 Circuit 1
line_1971	Line	Line LEATHERS 92.0 to MW1TAP 92.0 Circuit 1
line_1972	Line	Line NILAND 92.0 to LIB XX 92.0 Circuit 1
line_1973	Line	Line BOMBAY 92.0 to LIB XX 92.0 Circuit 1
line_1974	Line	Line USGYPS 92.0 to DIXIELAN 92.0 Circuit 1
line_1975	Line	Line AVE42 92.0 to SHAHILLS 92.0 Circuit 1
line_1976	Line	Line SHAHILLS 92.0 to CMTAP2 92.0 Circuit 1
line_1977	Line	Line NBSWYRD 92.0 to NTHBRTP2 92.0 Circuit 1
line_1978	Line	Line NBSWYRD 92.0 to NTHBRTP3 92.0 Circuit 1
line_1979	Line	Line PARKVIEW 92.0 to NBTAP 92.0 Circuit 1
line_1980	Line	Line CALIPAT 92.0 to NBTAP 92.0 Circuit 1
line_1981	Line	Line HOLTVILLE 92.0 to HOLT-TAP 92.0 Circuit 1
line_1982	Line	Line HOLT-TAP 92.0 to DROP4 92.0 Circuit 1
line_1983	Line	Line HOLT-TAP 92.0 to HIGHLINE 92.0 Circuit 1
line_1984	Line	Line AMRAD 345.0 to ARTESIA 345.0 Circuit 1
line_1985	Line	Line B-A 345.0 to GUADLUPE 345.0 Circuit 1
line_1986	Line	Line B-A 345.0 to NORTON 345.0 Circuit 1
line_1987	Line	Line B-A 345.0 to RIOPUERC 345.0 Circuit 1
line_1988	Line	Line CALIENTE 345.0 to AMRAD 345.0 Circuit 1
line_1989	Line	Line CALIENTE 345.0 to PICANTE 345.0 Circuit 1
line_1990	Line	Line FOURCORN 345.0 to RIOPUERC 345.0 Circuit 1
line_1991	Line	Line FOURCORN 345.0 to SAN_JUAN 345.0 Circuit 1
line_1992	Line	Line GUADLUPE 345.0 to TAIBANMS 345.0 Circuit 1
line_1993	Line	Line HIDALGO 345.0 to GREENLEE 345.0 Circuit 1
line_1994	Line	Line LUNA 345.0 to AFTON 345.0 Circuit 1
line_1995	Line	Line LUNA 345.0 to DIABLO 345.0 Circuit 1

2014 Single Contingency List (Category B)		
Contingency Number	**Type**	**Contingency Name**
line_1996	Line	Line LUNA 345.0 to HIDALGO 345.0 Circuit 1
line_1997	Line	Line LUNA 345.0 to LEF 345.0 Circuit 1
line_1998	Line	Line MACHO_SPRNGS 345.0 to LUNA 345.0 Circuit 1
line_1999	Line	Line MACHO_SPRNGS 345.0 to SPRINGR 345.0 Circuit 1
line_2000	Line	Line NEWMAN 345.0 to AFTON 345.0 Circuit 1
line_2001	Line	Line NEWMAN 345.0 to ARROYO 345.0 Circuit 1
line_2002	Line	Line OJO 345.0 to TAOS 345.0 Circuit 1
line_2003	Line	Line PICANTE 345.0 to NEWMAN 345.0 Circuit 1
line_2004	Line	Line RIOPUERC 345.0 to B-A 345.0 Circuit 2
line_2005	Line	Line RIOPUERC 345.0 to WESTMESA 345.0 Circuit 1
line_2006	Line	Line RIOPUERC 345.0 to WESTMESA 345.0 Circuit 2
line_2007	Line	Line SAN_JUAN 345.0 to B-A 345.0 Circuit 1
line_2008	Line	Line SAN_JUAN 345.0 to MCKINLEY 345.0 Circuit 1
line_2009	Line	Line SAN_JUAN 345.0 to MCKINLEY 345.0 Circuit 2
line_2010	Line	Line SAN_JUAN 345.0 to OJO 345.0 Circuit 1
line_2011	Line	Line SAN_JUAN 345.0 to RIOPUERC 345.0 Circuit 1
line_2012	Line	Line SHIPROCK 345.0 to SAN_JUAN 345.0 Circuit 1
line_2013	Line	Line TAIBANMS 345.0 to BLACKWTR 345.0 Circuit 1
line_2014	Line	Line WESTMESA 345.0 to ARROYO 345.0 Circuit 1
line_2015	Line	Line WESTMESA 345.0 to ARR___PS 345.0 Circuit 1
line_2016	Line	Line WESTMESA 345.0 to SANDIA 345.0 Circuit 1
line_2017	Line	Tran ARR___PS 345.00 to ARROYO 345.00 Circuit 1
line_2018	Line	Line 8311 230.0 to 8699 230.0 Circuit 1
line_2019	Line	Line 8311 230.0 to 8699 230.0 Circuit 2
line_2020	Line	Line CVSUB230 230.0 to MIRAGE 230.0 Circuit 1
line_2021	Line	Line CVSUB230 230.0 to RAMON 230.0 Circuit 1
line_2022	Line	Line IMPRLVLY 230.0 to ELCENTSW 230.0 Circuit 1
line_2023	Line	Line RAMON 230.0 to MIRAGE 230.0 Circuit 1
line_2024	Line	Line BLYTHE 161.0 to NILAND 161.0 Circuit 1
line_2025	Line	Line CVSUB161 161.0 to NILAND 161.0 Circuit 1
line_2026	Line	Line ELCENTSW 161.0 to NILAND 161.0 Circuit 1
line_2027	Line	Line ELCENTSW 161.0 to PILOTKNB 161.0 Circuit 1
line_2028	Line	Line KNOB 161.0 to PILOTKNB 161.0 Circuit 1
line_2029	Line	Line PILOTKNB 161.0 to YUCCA161 161.0 Circuit 1
line_2030	Line	Line COACHELLASW 92.0 to CVSUB92 92.0 Circuit 1

2014 Single Contingency List (Category B)		
Contingency Number	**Type**	**Contingency Name**
line_2031	Line	Line COACHELLASW 92.0 to CVSUB92 92.0 Circuit 2
line_2032	Line	Tran ELCENTSW 230.00 to ELSTEAMP 92.00 Circuit 1
line_2033	Line	Tran RAMON 230.00 to RAMON92 92.00 Circuit 1
line_2034	Line	Tran ELCENTSW 161.00 to ELCENTSW 230.00 Circuit 1
line_2035	Line	Tran ELCENTSW 161.00 to ELSTEAMP 92.00 Circuit 1
line_2036	Line	Tran PILOTKNB 161.00 to PILOTKNB 92.00 Circuit 1
line_2037	Line	Tran CVSUB92 92.00 to CVSUB230 230.00 Circuit 1
line_2038	Line	Tran CVSUB92 92.00 to CVSUB161 161.00 Circuit 1
line_2039	Line	Tran CVSUB92 92.00 to CVSUB230 230.00 Circuit 2
line_2040	Line	Tran NILAND 92.00 to NILAND 161.00 Circuit 1
line_2041	Line	Line HASSYAMP 500.0 to HDWSH 500.0 Circuit 1
line_2042	Line	Line HDWSH 500.0 to N.GILA 500.0 Circuit 1
line_2043	Line	Line N.GILA 500.0 to IMPRLVLY 500.0 Circuit 1
line_2044	Line	Line Q043B1 500.0 to HDWSH 500.0 Circuit 1
line_2045	Line	Line Q043B2 500.0 to HDWSH 500.0 Circuit 1
line_2046	Line	Line IMPRLVLY 230.0 to ELCENTSW 230.0 Circuit 1
line_2047	Line	Line IMPRLVLY 230.0 to ROA-230 230.0 Circuit 1
line_2048	Line	Line TDM 230 230.0 to IMPRLVLY 230.0 Circuit 1
line_2049	Line	Line TDM 230 230.0 to IMPRLVLY 230.0 Circuit 2
line_2050	Line	Tran SUNCREST 500.00 to SNCRSMP1 500.00 Circuit 1
line_2051	Line	Tran SUNCREST 500.00 to SNCRSMP2 500.00 Circuit 1
line_2052	Line	Tran IMPRLVLY 230.00 to IMPRLVLY 500.00 Circuit 1
line_2053	Line	Tran IMPRLVLY 230.00 to IMPRLVLY 500.00 Circuit 2
line_2054	Line	Tran IMPRLVLY 230.00 to IMPRLVLY 500.00 Circuit 3
line_2055	Line	Tran SUNCREST 230.00 to SNCRSMP1 500.00 Circuit 1
line_2056	Line	Tran SUNCREST 230.00 to SNCRSMP2 500.00 Circuit 1
line_2057	Line	Line DEVERS 500.0 to VALLEYSC 500.0 Circuit 1
line_2058	Line	Line DEVRSVC1 500.0 to DEVERS 500.0 Circuit 1
line_2059	Line	Line ELDORDO 500.0 to LUGO 500.0 Circuit 1
line_2060	Line	Line ELDORDO 500.0 to MCCULLGH 500.0 Circuit 1
line_2061	Line	Line MOENKOPI 500.0 to ELDORDO 500.0 Circuit 1
line_2062	Line	Line CVSUB230 230.0 to MIRAGE 230.0 Circuit 1
line_2063	Line	Line DEVERS 230.0 to MIRAGE 230.0 Circuit 1
line_2064	Line	Line DEVERS 230.0 to MIRAGE 230.0 Circuit 2
line_2065	Line	Line MEAD S 230.0 to ELDORDO 230.0 Circuit 1

2014 Single Contingency List (Category B)		
Contingency Number	**Type**	**Contingency Name**
line_2066	Line	Line MEAD S 230.0 to ELDORDO 230.0 Circuit 2
line_2067	Line	Line RAMON 230.0 to MIRAGE 230.0 Circuit 1
line_2068	Line	Line BLYTHE 161.0 to BLYTHESC 161.0 Circuit 1
line_2069	Line	Line ELDORDO2 230.0 to IVANPAH 230.0 Circuit 1
line_2070	Line	Line ELDORDO2 230.0 to IVANPAH 230.0 Circuit 2
tran_2071	Transformer	Tran GALLEGOS 230.00 to GALLEGOS 115.00 Circuit 1
tran_2072	Transformer	Tran SAN_JUAN 230.00 to HOGBAK 115.00 Circuit 1
tran_2073	Transformer	Tran CHOLLA 500.00 to CHOLLA 345.00 Circuit 1CHOLLA3T
tran_2074	Transformer	Tran CHOLLA 500.00 to CHOLLA 345.00 Circuit 2CHOLLA6T
tran_2075	Transformer	Tran FOURCORN 500.00 to FOURCORN 345.00 Circuit 14C 1AA T
tran_2076	Transformer	Tran SAGUARO 500.00 to SAG.EAST 115.00 Circuit 1SAGUAR7T
tran_2077	Transformer	Tran SAGUARO 500.00 to SAG.WEST 115.00 Circuit 1SAGUAR4T
tran_2078	Transformer	Tran WESTWING 500.00 to WESTWNGW 230.00 Circuit 2WESTWG 4
tran_2079	Transformer	Tran WESTWING 500.00 to WESTWNGW 230.00 Circuit 3WESTWG10
tran_2080	Transformer	Tran WESTWING 500.00 to WESTWNGE 230.00 Circuit 1WESTWG 1
tran_2081	Transformer	Tran WESTWING 500.00 to WESTWING 345.00 Circuit 1
tran_2082	Transformer	Tran YAVAPAI 500.00 to YAVAPAI 230.00 Circuit 1YAVAP 1T
tran_2083	Transformer	Tran YAVAPAI 500.00 to YAVAPAI 230.00 Circuit 2YAVAP 3T
tran_2084	Transformer	Tran GILARIVR 500.00 to GILARIVR 230.00 Circuit 1
tran_2085	Transformer	Tran MORGAN 500.00 to RACEWAY 230.00 Circuit 1MOR1
tran_2086	Transformer	Tran PNPKAPS 500.00 to PPAPS W 230.00 Circuit 1PP W
tran_2087	Transformer	Tran PNPKAPS 500.00 to PPAPS E 230.00 Circuit 1PP E
tran_2088	Transformer	Tran PNPKAPS 500.00 to PPAPS N 230.00 Circuit 1PP N
tran_2089	Transformer	Tran CHOLLA 345.00 to CHOLLA 230.00 Circuit 1CHOLLA7T
tran_2090	Transformer	Tran FOURCORN 345.00 to FOURCORN 230.00 Circuit 1FOURCN4T
tran_2091	Transformer	Tran FOURCORN 345.00 to FOURCORN 230.00 Circuit 2FOURCN8T
tran_2092	Transformer	Tran PNPKAPS 345.00 to PPAPS C 230.00 Circuit 1PNPK 7T
tran_2093	Transformer	Tran PNPKAPS 345.00 to PPAPS E 230.00 Circuit 3PNPK T14
tran_2094	Transformer	Tran PNPKAPS 345.00 to PPAPS N 230.00 Circuit 2PNPK T4
tran_2095	Transformer	Tran FOURCORN 230.00 to FCORNERS 69.00 Circuit 1FOURCN2T
tran_2096	Transformer	Tran PRESCOTT 230.00 to PRESCOTT 115.00 Circuit 1PRESCT1T
tran_2097	Transformer	Tran PRESCOTT 230.00 to PRESCOTT 115.00 Circuit 2PRESCT2T
tran_2098	Transformer	Tran RNDVLYAZ 230.00 to ROUNDVLY 69.00 Circuit 1
tran_2099	Transformer	Tran SAGUARO 230.00 to SAG.EAST 115.00 Circuit 1SAG 10T
tran_2100	Transformer	Tran SAGUARO 230.00 to SAG.WEST 115.00 Circuit 1SAG 1T

2014 Single Contingency List (Category B)		
Contingency Number	**Type**	**Contingency Name**
tran_2101	Transformer	Tran CEDARMT3 138.00 to CEDARMT 500.00 Circuit 1
tran_2102	Transformer	Tran CORONADO 500.00 to CORONADO 345.00 Circuit 1
tran_2103	Transformer	Tran CORONADO 500.00 to CORONADO 345.00 Circuit 2
tran_2104	Transformer	Tran KYRENE 500.00 to KYR-WEST 230.00 Circuit 6KYRENE6
tran_2105	Transformer	Tran KYRENE 500.00 to KYR-EAST 230.00 Circuit 7KYRENE7
tran_2106	Transformer	Tran KYRENE 500.00 to KYR-EAST 230.00 Circuit 8KYRENE8
tran_2107	Transformer	Tran PERKINS 500.00 to PERK PS1 500.00 Circuit 1
tran_2108	Transformer	Tran PERKINS 500.00 to PERK PS2 500.00 Circuit 1
tran_2109	Transformer	Tran SILVERKG 500.00 to SILVERKG 230.00 Circuit 1SILVERKG
tran_2110	Transformer	Tran BROWNING 500.00 to BROWNING 230.00 Circuit 1ABROWNIN1
tran_2111	Transformer	Tran BROWNING 500.00 to BROWNING 230.00 Circuit 1BBROWNIN2
tran_2112	Transformer	Tran RUDD 500.00 to RUDD 230.00 Circuit 1ARUDD1
tran_2113	Transformer	Tran RUDD 500.00 to RUDD 230.00 Circuit 1BRUDD2
tran_2114	Transformer	Tran RUDD 500.00 to RUDD 230.00 Circuit 3ARUDD3
tran_2115	Transformer	Tran RUDD 500.00 to RUDD 230.00 Circuit 3B
tran_2116	Transformer	Tran PINAL_W 500.00 to PINALWES 345.00 Circuit 1
tran_2117	Transformer	Tran DUKE 500.00 to TESTTRAK 230.00 Circuit 1
tran_2118	Transformer	Tran PINAL_C 500.00 to PINAL_C 230.00 Circuit 1
tran_2119	Transformer	Tran PINAL_C 500.00 to PINAL_C 230.00 Circuit 2
tran_2120	Transformer	Tran MESQUIT2 500.00 to MESQUITE 230.00 Circuit 1
tran_2121	Transformer	Tran MESQUITE 500.00 to MESQUITE 230.00 Circuit 1
tran_2122	Transformer	Tran GOLDFELD 230.00 to GOLDFELD 115.00 Circuit 1
tran_2123	Transformer	Tran GOLDFELD 230.00 to GOLDFELD 115.00 Circuit 2
tran_2124	Transformer	Tran SILVERKG 230.00 to SILVERK1 115.00 Circuit 1
tran_2125	Transformer	Tran SILVERKG 230.00 to SILVERK2 115.00 Circuit 1
tran_2126	Transformer	Tran WARD RS 69.00 to WARD 230.00 Circuit 1
tran_2127	Transformer	Tran WARD RS 69.00 to WARD 230.00 Circuit 2
tran_2128	Transformer	Tran AF-NORTH 69.00 to AGUAFRIA 230.00 Circuit 3
tran_2129	Transformer	Tran AF-NORTH 69.00 to AGUAFRIA 230.00 Circuit 4
tran_2130	Transformer	Tran KYRENEGT 69.00 to KYR-EAST 230.00 Circuit 2
tran_2131	Transformer	Tran KYRENEGT 69.00 to KYR-EAST 230.00 Circuit 3
tran_2132	Transformer	Tran KYRENEGT 69.00 to KYR-EAST 230.00 Circuit 4
tran_2133	Transformer	Tran SANTAN 69.00 to SANTAN 230.00 Circuit 3
tran_2134	Transformer	Tran SANTAN 69.00 to SANTAN 230.00 Circuit 4
tran_2135	Transformer	Tran SANTAN 69.00 to SANTAN 230.00 Circuit 5

2014 Single Contingency List (Category B)		
Contingency Number	**Type**	**Contingency Name**
tran_2136	Transformer	Tran ALEXANDR 69.00 to ALEXANDR 230.00 Circuit 1
tran_2137	Transformer	Tran ALEXANDR 69.00 to ALEXANDR 230.00 Circuit 2
tran_2138	Transformer	Tran ANDERSRS 69.00 to ANDERSON 230.00 Circuit 1
tran_2139	Transformer	Tran ANDERSRS 69.00 to ANDERSON 230.00 Circuit 2
tran_2140	Transformer	Tran ANDERSRS 69.00 to ANDERSON 230.00 Circuit 3
tran_2141	Transformer	Tran ANDERSRS 69.00 to ANDERSON 230.00 Circuit 4
tran_2142	Transformer	Tran SCHRADER 69.00 to SCHRADER 230.00 Circuit 1
tran_2143	Transformer	Tran SCHRADER 69.00 to SCHRADER 230.00 Circuit 4
tran_2144	Transformer	Tran SCHRADER 69.00 to SCHRADER 230.00 Circuit 3
tran_2145	Transformer	Tran BRANDOW 69.00 to BRANDOW 230.00 Circuit 1
tran_2146	Transformer	Tran BRANDOW 69.00 to BRANDOW 230.00 Circuit 2
tran_2147	Transformer	Tran BRANDOW 69.00 to BRANDOW 230.00 Circuit 3
tran_2148	Transformer	Tran CORBELRS 69.00 to CORBELL 230.00 Circuit 2
tran_2149	Transformer	Tran CORBELRS 69.00 to CORBELL 230.00 Circuit 3
tran_2150	Transformer	Tran CORBELRS 69.00 to CORBELL 230.00 Circuit 4
tran_2151	Transformer	Tran ORME RS 69.00 to ORME 230.00 Circuit 1
tran_2152	Transformer	Tran ORME RS 69.00 to ORME 230.00 Circuit 2
tran_2153	Transformer	Tran ORME RS 69.00 to ORME 230.00 Circuit 3
tran_2154	Transformer	Tran ORME RS 69.00 to ORME 230.00 Circuit 4
tran_2155	Transformer	Tran PAPAGOBT 69.00 to PAPAGOBT 230.00 Circuit 1
tran_2156	Transformer	Tran PAPAGOBT 69.00 to PAPAGOBT 230.00 Circuit 2
tran_2157	Transformer	Tran PAPAGOBT 69.00 to PAPAGOBT 230.00 Circuit 3
tran_2158	Transformer	Tran PAPAGOBT 69.00 to PAPAGOBT 230.00 Circuit 4
tran_2159	Transformer	Tran ROGERS 69.00 to ROGERS 230.00 Circuit 2
tran_2160	Transformer	Tran ROGERS 69.00 to ROGERS 230.00 Circuit 4
tran_2161	Transformer	Tran THUNDRST 69.00 to THUNDRST 230.00 Circuit 1
tran_2162	Transformer	Tran THUNDRST 69.00 to THUNDRST 230.00 Circuit 2
tran_2163	Transformer	Tran THUNDRST 69.00 to THUNDRST 230.00 Circuit 3
tran_2164	Transformer	Tran THUNDRST 69.00 to THUNDRST 230.00 Circuit 4
tran_2165	Transformer	Tran WHITETNK 69.00 to WHITETNK 230.00 Circuit 1
tran_2166	Transformer	Tran WHITETNK 69.00 to WHITETNK 230.00 Circuit 3
tran_2167	Transformer	Tran KNOX 69.00 to KNOX 230.00 Circuit 2
tran_2168	Transformer	Tran BROWNING 69.00 to BROWNING 230.00 Circuit 4
tran_2169	Transformer	Tran DINOSAUR 69.00 to DINOSAUR 230.00 Circuit 1
tran_2170	Transformer	Tran ABEL 69.00 to ABEL 230.00 Circuit 4

2014 Single Contingency List (Category B)		
Contingency Number	**Type**	**Contingency Name**
tran_2171	Transformer	Tran MCKINLEY 345.00 to YAHTAHEY 115.00 Circuit 1
tran_2172	Transformer	Tran SOUTH 345.00 to SOUTH 138.00 Circuit 1SOUTH2
tran_2173	Transformer	Tran SOUTH 345.00 to SOUTH 138.00 Circuit 2SOUTH2
tran_2174	Transformer	Tran VAIL 345.00 to VAIL 138.00 Circuit 1VAIL
tran_2175	Transformer	Tran VAIL 345.00 to VAIL 138.00 Circuit 3VAIL
tran_2176	Transformer	Tran VAIL2 345.00 to VAIL 138.00 Circuit 1
tran_2177	Transformer	Tran VAIL2 345.00 to VAIL 138.00 Circuit 2
tran_2178	Transformer	Tran WINCHSTR 345.00 to WINCHSTR 230.00 Circuit 1
tran_2179	Transformer	Tran TORTOLIT 138.00 to SAG.EAST 115.00 Circuit 1
tran_2180	Transformer	Tran TORTOLIT 138.00 to SAG.WEST 115.00 Circuit 1
tran_2181	Transformer	Tran TORTOLIT 138.00 to TORTOLIT 500.00 Circuit 1
tran_2182	Transformer	Tran TORTOLIT 138.00 to TORTOLIT 500.00 Circuit 2
tran_2183	Transformer	Tran TORTOLIT 138.00 to TORTOLIT 500.00 Circuit 3
tran_2184	Transformer	Tran TORTOLIT 138.00 to TORTOLIT 500.00 Circuit 4
tran_2185	Transformer	Tran TORTOLIT 138.00 to TORTLIT2 500.00 Circuit 1
tran_2186	Transformer	Tran IRVMID3 138.00 to IRVNGTN 138.00 Circuit 1
tran_2187	Transformer	Tran IRVMID4 138.00 to IRVNGTN 138.00 Circuit 1
tran_2188	Transformer	Tran N.HAVASU 69.00 to N.HAVASU 230.00 Circuit 1N.HAVASU
tran_2189	Transformer	Tran BLKMESA1 69.00 to BLK MESA 230.00 Circuit 1BLKMESA1
tran_2190	Transformer	Tran BLKMESA2 69.00 to BLK MESA 230.00 Circuit 1BLKMESA2
tran_2191	Transformer	Tran BLKMSA34 69.00 to BLK MESA 230.00 Circuit 1BLKMESA3
tran_2192	Transformer	Tran BLKMSA34 69.00 to BLK MESA 230.00 Circuit 2BLKMESA4
tran_2193	Transformer	Tran HILLTOP1 69.00 to HILLTOP 230.00 Circuit 1HILLTOP1
tran_2194	Transformer	Tran HILLTOP2 69.00 to HILLTOP 230.00 Circuit 1HILLTOP2
tran_2195	Transformer	Tran GRIFFITH 69.00 to GRIFFITH 230.00 Circuit 1
tran_2196	Transformer	Tran COPPERVR 345.00 to COPPERVR 230.00 Circuit 1
tran_2197	Transformer	Tran COPPERVR 345.00 to COPPERVR 230.00 Circuit 2
tran_2198	Transformer	Tran APACH-SW 69.00 to APACHE 115.00 Circuit 1
tran_2199	Transformer	Tran APACH-SW 69.00 to APACHE 115.00 Circuit 2
tran_2200	Transformer	Tran APACHE 230.00 to APACHE 115.00 Circuit 1
tran_2201	Transformer	Tran APACHE 230.00 to APACHE 115.00 Circuit 2
tran_2202	Transformer	Tran BICKNELL 230.00 to BICKNELL 115.00 Circuit 1
tran_2203	Transformer	Tran BICKNELL 230.00 to BICKNELL 115.00 Circuit 2
tran_2204	Transformer	Tran BICKNELL 345.00 to BICKNELL 230.00 Circuit 1
tran_2205	Transformer	Tran GREEN-SW 345.00 to GREEN-SW 230.00 Circuit 1

2014 Single Contingency List (Category B)		
Contingency Number	**Type**	**Contingency Name**
tran_2206	Transformer	Tran PANTANO 230.00 to PANTANO 115.00 Circuit 1
tran_2207	Transformer	Tran RIVIERA 69.00 to RIVIERA 230.00 Circuit 1
tran_2208	Transformer	Tran RIVIERA 69.00 to RIVIERA 230.00 Circuit 2
tran_2209	Transformer	Tran DOSCONDO 69.00 to DOSCONDO 230.00 Circuit 1
tran_2210	Transformer	Tran DOSCONDO 69.00 to DOSCONDO 230.00 Circuit 2
tran_2211	Transformer	Tran KARTCHNR 69.00 to KARTCHNR 115.00 Circuit 1
tran_2212	Transformer	Tran HACKBERY 69.00 to HACKBERY 230.00 Circuit 1
tran_2213	Transformer	Tran HACKBERY 69.00 to HACKBERY 230.00 Circuit 2
tran_2214	Transformer	Tran RED TAIL 69.00 to RED TAIL 230.00 Circuit 1
tran_2215	Transformer	Tran SAN RAF 69.00 to SAN RAF 230.00 Circuit 1
tran_2216	Transformer	Tran BICKNELL 69.00 to BICKNELL 115.00 Circuit 1
tran_2217	Transformer	Tran TOPOCK 69.00 to TOPOCK 230.00 Circuit 1
tran_2218	Transformer	Tran COL-SCIP 115.00 to COL-SCIP 69.00 Circuit 1
tran_2219	Transformer	Tran COL-SCIP 115.00 to COL-SCIP 69.00 Circuit 2
tran_2220	Transformer	Tran MEAD S 230.00 to MEAD B 69.00 Circuit 1
tran_2221	Transformer	Tran MEAD S 230.00 to MEAD A 69.00 Circuit 1
tran_2222	Transformer	Tran MEAD S 230.00 to MEAD 287.00 Circuit 1
tran_2223	Transformer	Tran MEAD 345.00 to MEAD N 230.00 Circuit 1MEAD
tran_2224	Transformer	Tran MEAD 500.00 to MEAD N 230.00 Circuit 1
tran_2225	Transformer	Tran MEAD 500.00 to MEAD N 230.00 Circuit 2
tran_2226	Transformer	Tran PARKERAZ 161.00 to PARKERAZ 69.00 Circuit 1
tran_2227	Transformer	Tran PARKER 230.00 to PARKERAZ 161.00 Circuit 1
tran_2228	Transformer	Tran PARKER 230.00 to PARKERAZ 161.00 Circuit 2
tran_2229	Transformer	Tran COOLIDGE 230.00 to COOLIDGE 115.00 Circuit 1COL12-1
tran_2230	Transformer	Tran COOLIDGE 230.00 to COOLIDGE 115.00 Circuit 2COL12-2
tran_2231	Transformer	Tran GILA YU 161.00 to GILA 69.00 Circuit 1GILAYU1
tran_2232	Transformer	Tran GILA YU 161.00 to GILA 69.00 Circuit 2GILAYU2
tran_2233	Transformer	Tran LIBERTY 345.00 to LIBTYPS 230.00 Circuit 1LIBERTY
tran_2234	Transformer	Tran ORACLE 115.00 to ORACLE 69.00 Circuit 1
tran_2235	Transformer	Tran ORACLE 115.00 to ORACLE 69.00 Circuit 2
tran_2236	Transformer	Tran LIBTYPS 230.00 to LIBERTY 230.00 Circuit 1
tran_2237	Transformer	Tran TESTTRAK 230.00 to TESTTRAK 69.00 Circuit 1
tran_2238	Transformer	Tran HARCUVAR 230.00 to HARCUVAR 115.00 Circuit 1
tran_2239	Transformer	Tran HEADGATE 161.00 to HEADGATE 69.00 Circuit 1
tran_2240	Transformer	Tran HEADGATE 161.00 to HEADGATE 69.00 Circuit 2

2014 Single Contingency List (Category B)		
Contingency Number	**Type**	**Contingency Name**
tran_2241	Transformer	Tran SPOOKHIL 230.00 to SPOOKHIL 69.00 Circuit 1
tran_2242	Transformer	Tran SPOOKHIL 230.00 to SPOOKHIL 69.00 Circuit 2
tran_2243	Transformer	Tran CASAGRND 230.00 to CASAGRND 115.00 Circuit 1
tran_2244	Transformer	Tran LONEBUTT 230.00 to LONGTIN 69.00 Circuit 1
tran_2245	Transformer	Tran PEACOCK 345.00 to PEACOCK 230.00 Circuit 1
tran_2246	Transformer	Tran KOFA 161.00 to KOFA 69.00 Circuit 1
tran_2247	Transformer	Tran GLEN PS 230.00 to GLENCANY 230.00 Circuit 1
tran_2248	Transformer	Tran GLENCANY 345.00 to GLENCANY 230.00 Circuit 1
tran_2249	Transformer	Tran GLENCANY 345.00 to GLENCANY 230.00 Circuit 2
tran_2250	Transformer	Tran PPK WAPA 345.00 to PPKWAPA 230.00 Circuit 1PPKWAPA1
tran_2251	Transformer	Tran PPK WAPA 345.00 to PPKWAPA 230.00 Circuit 2PPKWAPA2
tran_2252	Transformer	Tran PPK WAPA 345.00 to PPKWAPA 230.00 Circuit 3PPKWAPA3
tran_2253	Transformer	Tran SHIP PS 230.00 to SHIPROCK 230.00 Circuit 1
tran_2254	Transformer	Tran SHIPROCK 230.00 to SHIPROCK 115.00 Circuit 1SHIPROCK
tran_2255	Transformer	Tran SHIPROCK 345.00 to SHIPROCK 230.00 Circuit 1
tran_2256	Transformer	Tran CASGRAPS 230.00 to CASGRAPS 69.00 Circuit 1CASGRA2T
tran_2257	Transformer	Tran SNTAROSA 230.00 to SNTAROSA 69.00 Circuit 1SNTARS7T
tran_2258	Transformer	Tran MILLIGAN 230.00 to MILLIGAN 69.00 Circuit 1MILLGN2T
tran_2259	Transformer	Tran SNMANUEL 115.00 to SNMANUEL 100.00 Circuit 1
tran_2260	Transformer	Tran VLYFARMS 115.00 to VLYFARMS 69.00 Circuit 1
tran_2261	Transformer	Tran PINAL 115.00 to PINAL 69.00 Circuit 1
tran_2262	Transformer	Tran MURAL 69.00 to MURAL 115.00 Circuit 1MURALT3T
tran_2263	Transformer	Tran N.GILA 500.00 to N.GILA 69.00 Circuit 1N.GILA4T
tran_2264	Transformer	Tran N.GILA 500.00 to N.GILA 69.00 Circuit 2N.GILA3T
tran_2265	Transformer	Tran EAGLEYE 230.00 to EAGLEY E 69.00 Circuit 1EAGLEY3T
tran_2266	Transformer	Tran EAGLEYE 230.00 to EAGLEY W 69.00 Circuit 1EAGLEY4T
tran_2267	Transformer	Tran SGRLF 500.00 to SGRLF 69.00 Circuit 1SGRLF 2T
tran_2268	Transformer	Tran DUGAS 500.00 to DUGAS 69.00 Circuit 1DUGAS 2T
tran_2269	Transformer	Tran CHOLLA 345.00 to CHOLLA2 69.00 Circuit 1
tran_2270	Transformer	Tran PRECHCYN 345.00 to PRECHCYN 69.00 Circuit 1PRECHC1T
tran_2271	Transformer	Tran PRECHCYN 345.00 to PRECHCYN 69.00 Circuit 2PRECHC6T
tran_2272	Transformer	Tran CHOLLA 230.00 to CHOLLA1 69.00 Circuit 1CHOLLA1T
tran_2273	Transformer	Tran CHOLLA 230.00 to CHOLLA2 69.00 Circuit 1CHOLLA2T
tran_2274	Transformer	Tran COCONINO 230.00 to COCONINO 69.00 Circuit 1COCON12T
tran_2275	Transformer	Tran COCONINO 230.00 to COCONINO 69.00 Circuit 2COCON 4T

2014 Single Contingency List (Category B)		
Contingency Number	**Type**	**Contingency Name**
tran_2276	Transformer	Tran VERDE N 230.00 to VERDE 69.00 Circuit 1VERDE10T
tran_2277	Transformer	Tran YAVAPAI 230.00 to YAVAPAIW 69.00 Circuit 1YAVAP11T
tran_2278	Transformer	Tran VERDE S 230.00 to VERDE 69.00 Circuit 1VERDE 3T
tran_2279	Transformer	Tran WILOWLKE 230.00 to WILOWLKE 69.00 Circuit 1WLOLK 6T
tran_2280	Transformer	Tran WILOWLKW 230.00 to WILOWLKW 69.00 Circuit 1WLOLK10T
tran_2281	Transformer	Tran CORONADO 500.00 to $CORONAD 69.00 Circuit 1
tran_2282	Transformer	Tran BUCKEYE 230.00 to BUCKEYE 69.00 Circuit 1BUCKEY6T
tran_2283	Transformer	Tran BUCKEYE 230.00 to BUCKEYE 69.00 Circuit 2BUCKEY2T
tran_2284	Transformer	Tran CACTUS 230.00 to CACTUS E 69.00 Circuit 1CACTUS6T
tran_2285	Transformer	Tran CACTUS 230.00 to CACTUS C 69.00 Circuit 1CACTS10T
tran_2286	Transformer	Tran CACTUS 230.00 to CACTUS W 69.00 Circuit 1CACTS14T
tran_2287	Transformer	Tran CTRYCLUB 230.00 to CTRYCLBN 69.00 Circuit 1CTRYCL6T
tran_2288	Transformer	Tran CTRYCLUB 230.00 to CTRYCLBS 69.00 Circuit 1
tran_2289	Transformer	Tran DEERVALY 230.00 to DEERVALE 69.00 Circuit 1DEERV14T
tran_2290	Transformer	Tran DEERVALY 230.00 to DEERVALW 69.00 Circuit 1DEERVL6T
tran_2291	Transformer	Tran DEERVALY 230.00 to DEERVALC 69.00 Circuit 2DEERV10T
tran_2292	Transformer	Tran EL SOL 230.00 to EL SOLMN 69.00 Circuit 1EL SOL4T
tran_2293	Transformer	Tran EL SOL 230.00 to EL SOLMS 69.00 Circuit 1ELSOL12T
tran_2294	Transformer	Tran LINCSTRT 230.00 to LINCOLNE 69.00 Circuit 1LINCS10T
tran_2295	Transformer	Tran LONEPEAK 230.00 to LONEPK E 69.00 Circuit 1LONEPK7T
tran_2296	Transformer	Tran LONEPEAK 230.00 to LONEPK W 69.00 Circuit 1LONEPK1T
tran_2297	Transformer	Tran MEADOWBK 230.00 to MEADOWBN 69.00 Circuit 1MEADOW9T
tran_2298	Transformer	Tran OCOTILLO 230.00 to OCOTIL N 69.00 Circuit 1OCOTIL1T
tran_2299	Transformer	Tran OCOTILLO 230.00 to OCOTIL S 69.00 Circuit 1
tran_2300	Transformer	Tran REACH 230.00 to REACH 69.00 Circuit 1REACH 4T
tran_2301	Transformer	Tran REACH 230.00 to REACH 69.00 Circuit 2REACH 2T
tran_2302	Transformer	Tran PPAPS W 230.00 to PINNPK W 69.00 Circuit 1PNPK 3T
tran_2303	Transformer	Tran SUNYSLOP 230.00 to SUNYSLPE 69.00 Circuit 1SUNYSL3T
tran_2304	Transformer	Tran SUNYSLOP 230.00 to SUNYSLPW 69.00 Circuit 1SUNYSL1T
tran_2305	Transformer	Tran SURPRISE 230.00 to SURPRISN 69.00 Circuit 1SURPR12T
tran_2306	Transformer	Tran SURPRISE 230.00 to SURPRISS 69.00 Circuit 1SURPR 4T
tran_2307	Transformer	Tran SURPRISE 230.00 to SURPRISC 69.00 Circuit 1SURPR 8T
tran_2308	Transformer	Tran WHTNKAPS 230.00 to WHTNKAPS 69.00 Circuit 2WHTNK 8T
tran_2309	Transformer	Tran WHTNKAPS 230.00 to WHTNKAPN 69.00 Circuit 1WHTNK 5T
tran_2310	Transformer	Tran WPHXAPSS 230.00 to WPHXAPSN 69.00 Circuit 1WPHX 10T

2014 Single Contingency List (Category B)		
Contingency Number	**Type**	**Contingency Name**
tran_2311	Transformer	Tran WPHXAPSS 230.00 to WPHXAPSS 69.00 Circuit 1WPHX T16
tran_2312	Transformer	Tran WPHXAPSS 230.00 to WPHXAPSC 69.00 Circuit 1WPHX 14T
tran_2313	Transformer	Tran GILABEND 230.00 to GILABEND 69.00 Circuit 1GILAB12T
tran_2314	Transformer	Tran GILABEND 230.00 to GILABEND 69.00 Circuit 2GILABD8T
tran_2315	Transformer	Tran GAVILNPK 230.00 to GAVILNPK 69.00 Circuit 1GAVNPK1T
tran_2316	Transformer	Tran RACEWAY 230.00 to RACEWAY 69.00 Circuit 1RACEWY8T
tran_2317	Transformer	Tran PLMVLY 230.00 to PLMVLY 69.00 Circuit 1PLMVLY T
tran_2318	Transformer	Tran WESTWNGE 230.00 to WESTWING 69.00 Circuit 1WESTW11T
tran_2319	Transformer	Tran WESTWNGE 230.00 to WESTWING 69.00 Circuit 2WESTW14T
tran_2320	Transformer	Tran PPAPS C 230.00 to PINNPK E 69.00 Circuit 1PNPK 6T
tran_2321	Transformer	Tran AGUAFRIA 230.00 to AFRAAPSN 69.00 Circuit 1AGUAFR5T
tran_2322	Transformer	Tran ALEXANDR 230.00 to ALEXNDR 69.00 Circuit 1ALEXND1T
tran_2323	Transformer	Tran PPAPS E 230.00 to PINPKEST 69.00 Circuit 1PNPK 17T
tran_2324	Transformer	Tran YOUNGSCY 345.00 to YOUNGSCY 69.00 Circuit 2YOUNGS2T
tran_2325	Transformer	Tran AVSOLAR 115.00 to AVSOLAR 500.00 Circuit 1
tran_2326	Transformer	Tran BLACK PK 161.00 to BLACK PK 69.00 Circuit 1BLACKPKT
tran_2327	Transformer	Tran YUCCA161 161.00 to YUCCA W 69.00 Circuit 2YUCCA 2T
tran_2328	Transformer	Tran YUCCA161 161.00 to YUCCA W 69.00 Circuit 1YUCCA 1T
tran_2329	Transformer	Tran PPAPS E 230.00 to PINPKEST 69.00 Circuit 2PNPK 19T
tran_2330	Transformer	Tran CVSUB92 92.00 to CVSUB230 230.00 Circuit 1
tran_2331	Transformer	Tran CVSUB92 92.00 to CVSUB230 230.00 Circuit 2
tran_2332	Transformer	Tran CVSUB92 92.00 to CVSUB161 161.00 Circuit 1
tran_2333	Transformer	Tran AVE58 92.00 to AVE58 161.00 Circuit 1
tran_2334	Transformer	Tran ELCENTSW 161.00 to ELSTEAMP 92.00 Circuit 1
tran_2335	Transformer	Tran ELCENTSW 161.00 to ELCENTSW 230.00 Circuit 1
tran_2336	Transformer	Tran NILAND 161.00 to NILAND 92.00 Circuit 1
tran_2337	Transformer	Tran PILOTKNB 161.00 to PILOTKNB 92.00 Circuit 1PILOTKN2
tran_2338	Transformer	Tran RAMON92 92.00 to RAMON 230.00 Circuit 1
tran_2339	Transformer	Tran HIGHLINE 230.00 to HIGHLINE 92.00 Circuit 1
tran_2340	Transformer	Tran MIDWAY 230.00 to MIDWAY 92.00 Circuit 1
tran_2341	Transformer	Tran MIDWAY 230.00 to MIDWAY 92.00 Circuit 2
tran_2342	Transformer	Tran ELCENTSW 230.00 to ELSTEAMP 92.00 Circuit 1
tran_2343	Transformer	Tran CVSUB92 92.00 to CVSUB230 230.00 Circuit 3
tran_2344	Transformer	Tran AVE58 92.00 to AVE58 161.00 Circuit 2
tran_2345	Transformer	Tran YUCCA161 161.00 to YUCCA W 69.00 Circuit 2YUCCA 2T

2014 Single Contingency List (Category B)		
Contingency Number	**Type**	**Contingency Name**
tran_2346	Transformer	Tran YUCCA161 161.00 to YUCCA W 69.00 Circuit 1YUCCA 1T
tran_2347	Transformer	Tran ELDORDO2 230.0 to ELDORDO 500.0 Circuit 1
tran_2348	Transformer	Tran ELDORDO2 230.0 to ELDORDO 500.0 Circuit 2
tran_2349	Transformer	Tran DEVERS 500.00 to DEVERS 230.00 Circuit 1DEVERS T
tran_2350	Transformer	Tran DEVERS 500.00 to DEVERS 230.00 Circuit 2DEVERS2T
tran_2351	Transformer	Tran ELDORDO 500.00 to ELDORDO 230.00 Circuit 1ELDOR 1T
tran_2352	Transformer	Tran ELDORDO 500.00 to ELDORDO 230.00 Circuit 2ELDOR 2T
tran_2353	Transformer	Tran DEVERS 115.00 to DEVERS 230.00 Circuit 1
tran_2354	Transformer	Tran DEVERS 115.00 to DEVERS 230.00 Circuit 3
tran_2355	Transformer	Tran DEVERS 115.00 to DEVERS 230.00 Circuit 4
gen_2356	Generator	Gen ABEL G1 13.8 Unit ID 1
gen_2357	Generator	Gen ABEL G2 13.8 Unit ID 1
gen_2358	Generator	Gen ABEL G3 13.8 Unit ID 1
gen_2359	Generator	Gen ABEL G4 13.8 Unit ID 1
gen_2360	Generator	Gen ABEL G5 13.8 Unit ID 1
gen_2361	Generator	Gen ABEL G6 13.8 Unit ID 1
gen_2362	Generator	Gen ABEL G7 13.8 Unit ID 1
gen_2363	Generator	Gen ABEL G8 13.8 Unit ID 1
gen_2364	Generator	Gen ABEL G9 13.8 Unit ID 1
gen_2365	Generator	Gen ABITIBI 13.8 Unit ID 1
gen_2366	Generator	Gen AGUAFR 1 13.8 Unit ID 1
gen_2367	Generator	Gen AGUAFR 2 13.8 Unit ID 1
gen_2368	Generator	Gen AGUAFR 3 18.0 Unit ID 1
gen_2369	Generator	Gen APACHST2 20.0 Unit ID 1
gen_2370	Generator	Gen APACHST3 20.0 Unit ID 1
gen_2371	Generator	Gen ARL-CT1 18.0 Unit ID 1
gen_2372	Generator	Gen ARL-CT2 18.0 Unit ID 1
gen_2373	Generator	Gen ARL-ST1 18.0 Unit ID 1
gen_2374	Generator	Gen BOWIE_G1 18.0 Unit ID 1
gen_2375	Generator	Gen BOWIE_G2 18.0 Unit ID 1
gen_2376	Generator	Gen BOWIE_G3 18.0 Unit ID 1
gen_2377	Generator	Gen BOWIE_G4 18.0 Unit ID 1
gen_2378	Generator	Gen BOWIE_S1 18.0 Unit ID 1
gen_2379	Generator	Gen BOWIE_S2 18.0 Unit ID 1
gen_2380	Generator	Gen C643T_G1 0.5 Unit ID C3

2014 Single Contingency List (Category B)		
Contingency Number	**Type**	**Contingency Name**
gen_2381	Generator	Gen C643T_G2 0.5 Unit ID C3
gen_2382	Generator	Gen C643T_G3 0.5 Unit ID C3
gen_2383	Generator	Gen C643T_G4 0.5 Unit ID C3
gen_2384	Generator	Gen C643T_G5 0.5 Unit ID C3
gen_2385	Generator	Gen C643T_G6 0.5 Unit ID C3
gen_2386	Generator	Gen C643T_G7 0.5 Unit ID C3
gen_2387	Generator	Gen CEDARMT 0.7 Unit ID 1
gen_2388	Generator	Gen CHOLLA 13.8 Unit ID 1
gen_2389	Generator	Gen CHOLLA2 22.0 Unit ID 1
gen_2390	Generator	Gen CHOLLA3 22.0 Unit ID 1
gen_2391	Generator	Gen CHOLLA4 22.0 Unit ID 1
gen_2392	Generator	Gen CORONAD1 22.0 Unit ID 1
gen_2393	Generator	Gen CORONAD2 22.0 Unit ID 1
gen_2394	Generator	Gen BADGER 0.7 Unit ID 1
gen_2395	Generator	Gen CRISMON 69.0 Unit ID 1
gen_2396	Generator	Gen CROSSHYD 69.0 Unit ID 1
gen_2397	Generator	Gen DARBY 12.5 Unit ID 1
gen_2398	Generator	Gen WASTEMGT 12.5 Unit ID 1
gen_2399	Generator	Gen DBG-CT1 18.0 Unit ID 1
gen_2400	Generator	Gen DBG-CT2 18.0 Unit ID 1
gen_2401	Generator	Gen DBG-ST1 18.0 Unit ID 1
gen_2402	Generator	Gen DMPCCT#1 13.8 Unit ID 1
gen_2403	Generator	Gen DMPCCT#2 13.8 Unit ID 1
gen_2404	Generator	Gen DMPCCT#3 13.8 Unit ID 1
gen_2405	Generator	Gen FAIRVW11 12.5 Unit ID 1
gen_2406	Generator	Gen FCNGEN 1 20.0 Unit ID 1
gen_2407	Generator	Gen FCNGEN 2 20.0 Unit ID 1
gen_2408	Generator	Gen FCNGEN 3 20.0 Unit ID 1
gen_2409	Generator	Gen FCNGN4CC 22.0 Unit ID H
gen_2410	Generator	Gen FCNGN4CC 22.0 Unit ID L
gen_2411	Generator	Gen FCNGN5CC 22.0 Unit ID H
gen_2412	Generator	Gen FCNGN5CC 22.0 Unit ID L
gen_2413	Generator	Gen GIL-CT1 18.0 Unit ID 1
gen_2414	Generator	Gen GIL-CT2 18.0 Unit ID 1
gen_2415	Generator	Gen GIL-CT3 18.0 Unit ID 1

2014 Single Contingency List (Category B)		
Contingency Number	**Type**	**Contingency Name**
gen_2416	Generator	Gen GIL-CT4 18.0 Unit ID 1
gen_2417	Generator	Gen GIL-CT5 18.0 Unit ID 1
gen_2418	Generator	Gen GIL-CT6 18.0 Unit ID 1
gen_2419	Generator	Gen GIL-CT7 18.0 Unit ID 1
gen_2420	Generator	Gen GIL-CT8 18.0 Unit ID 1
gen_2421	Generator	Gen GIL-ST1 18.0 Unit ID 1
gen_2422	Generator	Gen GIL-ST2 18.0 Unit ID 1
gen_2423	Generator	Gen GIL-ST3 18.0 Unit ID 1
gen_2424	Generator	Gen GIL-ST4 18.0 Unit ID 1
gen_2425	Generator	Gen GLENC1-2 13.8 Unit ID 1
gen_2426	Generator	Gen GLENC1-2 13.8 Unit ID 2
gen_2427	Generator	Gen GLENC3-4 13.8 Unit ID 3
gen_2428	Generator	Gen GLENC3-4 13.8 Unit ID 4
gen_2429	Generator	Gen GLENC5-6 13.8 Unit ID 5
gen_2430	Generator	Gen GLENC5-6 13.8 Unit ID 6
gen_2431	Generator	Gen GLENC7-8 13.8 Unit ID 7
gen_2432	Generator	Gen GLENC7-8 13.8 Unit ID 8
gen_2433	Generator	Gen GRIFFTH1 18.0 Unit ID 1
gen_2434	Generator	Gen GRIFFTH2 18.0 Unit ID 2
gen_2435	Generator	Gen GRIFFTH3 18.0 Unit ID 3
gen_2436	Generator	Gen HGC-CT1 16.0 Unit ID 1
gen_2437	Generator	Gen HGC-CT2 16.0 Unit ID 1
gen_2438	Generator	Gen HGC-CT3 16.0 Unit ID 1
gen_2439	Generator	Gen HGC-ST1 13.8 Unit ID 1
gen_2440	Generator	Gen HGC-ST2 13.8 Unit ID 1
gen_2441	Generator	Gen HGC-ST3 13.8 Unit ID 1
gen_2442	Generator	Gen HOOVERA3 16.5 Unit ID 1
gen_2443	Generator	Gen HOOVERA4 16.5 Unit ID 1
gen_2444	Generator	Gen HOOVERA5 16.5 Unit ID 1
gen_2445	Generator	Gen HOOVERA6 16.5 Unit ID 1
gen_2446	Generator	Gen HOOVERA7 16.5 Unit ID 1
gen_2447	Generator	Gen HOVRA1A2 16.5 Unit ID A1
gen_2448	Generator	Gen HOVRA1A2 16.5 Unit ID A2
gen_2449	Generator	Gen HOVRN1N2 16.5 Unit ID N1
gen_2450	Generator	Gen HOVRN1N2 16.5 Unit ID N2

2014 Single Contingency List (Category B)		
Contingency Number	**Type**	**Contingency Name**
gen_2451	Generator	Gen HOVRN3N4 16.5 Unit ID N3
gen_2452	Generator	Gen HOVRN3N4 16.5 Unit ID N4
gen_2453	Generator	Gen HOVRN5N6 16.5 Unit ID N5
gen_2454	Generator	Gen HOVRN5N6 16.5 Unit ID N6
gen_2455	Generator	Gen HOVRN7N8 16.5 Unit ID N7
gen_2456	Generator	Gen HOVRN7N8 16.5 Unit ID N8
gen_2457	Generator	Gen KYREN 7A 18.0 Unit ID 1
gen_2458	Generator	Gen KYREN 7S 13.8 Unit ID 1
gen_2459	Generator	Gen MERIDIAN 2.3 Unit ID 1
gen_2460	Generator	Gen MES-CT1 18.0 Unit ID 1
gen_2461	Generator	Gen MES-CT2 18.0 Unit ID 1
gen_2462	Generator	Gen MES-CT3 18.0 Unit ID 1
gen_2463	Generator	Gen MES-CT4 18.0 Unit ID 1
gen_2464	Generator	Gen MES-ST1 18.0 Unit ID 1
gen_2465	Generator	Gen MES-ST2 18.0 Unit ID 1
gen_2466	Generator	Gen NAVAJO 1 26.0 Unit ID 1
gen_2467	Generator	Gen NAVAJO 2 26.0 Unit ID 1
gen_2468	Generator	Gen NAVAJO 3 26.0 Unit ID 1
gen_2469	Generator	Gen NELP_SVC 138.0 Unit ID SV
gen_2470	Generator	Gen OCOTGT1 13.8 Unit ID 1
gen_2471	Generator	Gen OCOTST1 13.8 Unit ID 1
gen_2472	Generator	Gen OCOTST2 13.8 Unit ID 1
gen_2473	Generator	Gen OLIVE G 69.0 Unit ID 1
gen_2474	Generator	Gen PALOVRD1 24.0 Unit ID 1
gen_2475	Generator	Gen PALOVRD2 24.0 Unit ID 1
gen_2476	Generator	Gen PALOVRD3 24.0 Unit ID 1
gen_2477	Generator	Gen Q044STG1 13.8 Unit ID 1
gen_2478	Generator	Gen Q044STG2 13.8 Unit ID 2
gen_2479	Generator	Gen Q43_GEN1 0.4 Unit ID 1
gen_2480	Generator	Gen Q43_GEN2 0.4 Unit ID 2
gen_2481	Generator	Gen QUAIL G1 69.0 Unit ID 1
gen_2482	Generator	Gen QUAIL G2 69.0 Unit ID 1
gen_2483	Generator	Gen RED-CT1 18.0 Unit ID 1
gen_2484	Generator	Gen RED-CT2 18.0 Unit ID 1
gen_2485	Generator	Gen RED-CT3 18.0 Unit ID 1

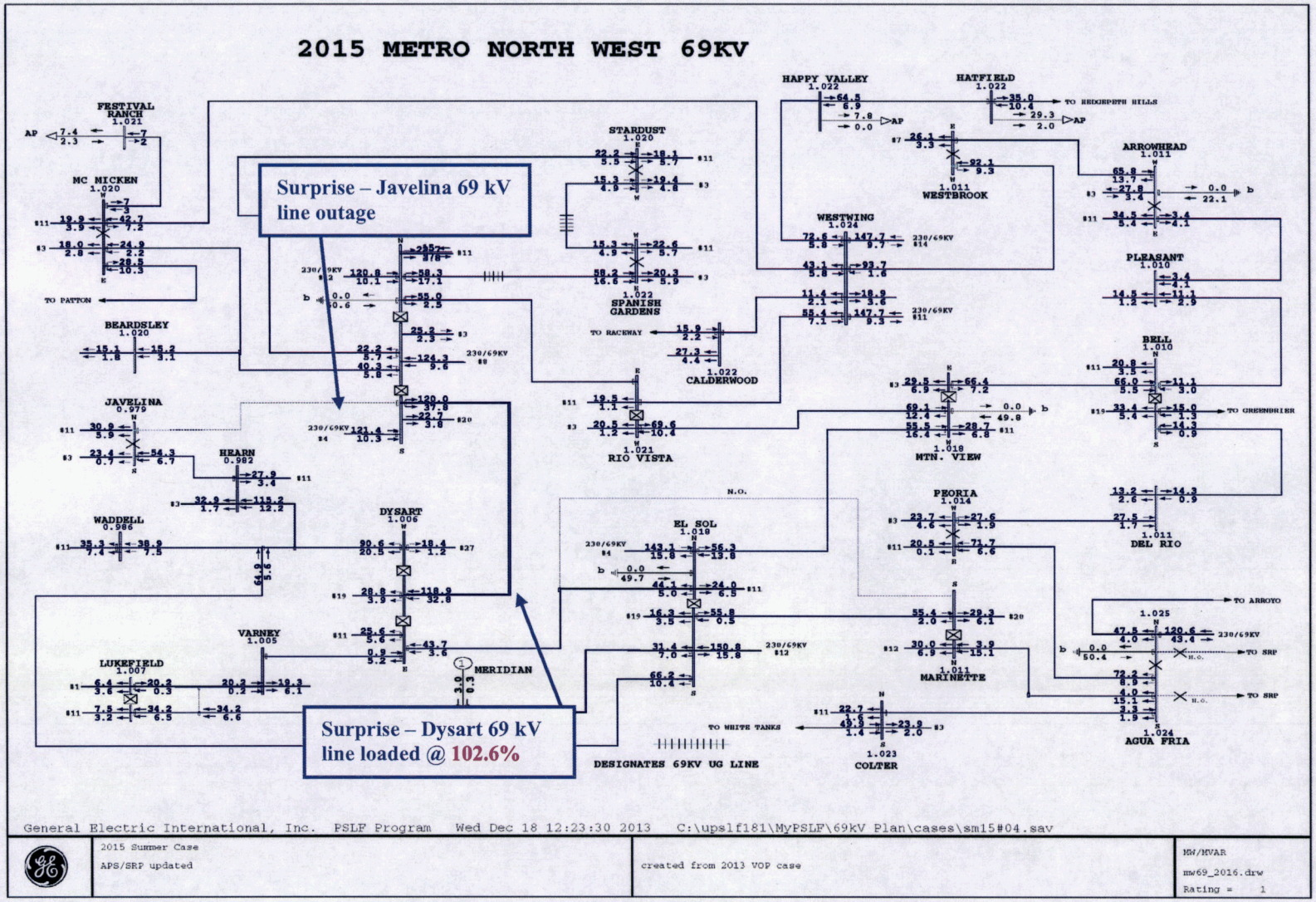
2014 Single Contingency List (Category B)		
Contingency Number	**Type**	**Contingency Name**
gen_2486	Generator	Gen RED-CT4 18.0 Unit ID 1
gen_2487	Generator	Gen RED-ST1 18.0 Unit ID 1
gen_2488	Generator	Gen RED-ST2 18.0 Unit ID 1
gen_2489	Generator	Gen SAGUARO1 15.5 Unit ID 1
gen_2490	Generator	Gen SAGUARO2 15.5 Unit ID 1
gen_2491	Generator	Gen SANTAN 1 13.8 Unit ID 1
gen_2492	Generator	Gen SANTAN 2 13.8 Unit ID 1
gen_2493	Generator	Gen SANTAN 3 13.8 Unit ID 2
gen_2494	Generator	Gen SANTAN 4 13.8 Unit ID 1
gen_2495	Generator	Gen SANTN 5A 18.0 Unit ID 1
gen_2496	Generator	Gen SANTN 5B 18.0 Unit ID 1
gen_2497	Generator	Gen SANTN 5S 18.0 Unit ID 1
gen_2498	Generator	Gen SANTN 6A 18.0 Unit ID 1
gen_2499	Generator	Gen SANTN 6S 13.8 Unit ID 1
gen_2500	Generator	Gen SOPOINT1 18.0 Unit ID 1
gen_2501	Generator	Gen SOPOINT2 18.0 Unit ID 2
gen_2502	Generator	Gen SOPOINT3 18.0 Unit ID 3
gen_2503	Generator	Gen SPR GEN1 19.0 Unit ID 1
gen_2504	Generator	Gen SPR GEN2 19.0 Unit ID 1
gen_2505	Generator	Gen SPR GEN3 21.0 Unit ID 1
gen_2506	Generator	Gen SPR GEN4 21.0 Unit ID 1
gen_2507	Generator	Gen SUNDTGE1 13.8 Unit ID 1
gen_2508	Generator	Gen SUNDTGE2 13.8 Unit ID 1
gen_2509	Generator	Gen SUNDTGE3 13.8 Unit ID 1
gen_2510	Generator	Gen SUNDTGE4 18.0 Unit ID 1
gen_2511	Generator	Gen TORO 138.0 Unit ID SC
gen_2512	Generator	Gen WPCC4CT1 13.8 Unit ID 1
gen_2513	Generator	Gen WPCC5CT1 15.0 Unit ID 1
gen_2514	Generator	Gen WPCC5CT2 15.0 Unit ID 1
gen_2515	Generator	Gen WPCC5ST1 16.5 Unit ID 1
gen_2516	Generator	Gen WPHX CC1 13.8 Unit ID 1
gen_2517	Generator	Gen WPHX CC2 13.8 Unit ID 1
gen_2518	Generator	Gen WPHX CC3 13.8 Unit ID 1
gen_2519	Generator	Gen WPHX GT1 13.8 Unit ID 1
gen_2520	Generator	Gen WPHX GT2 13.8 Unit ID 1

2014 Single Contingency List (Category B)		
Contingency Number	**Type**	**Contingency Name**
gen_2521	Generator	Gen YCACT1 13.8 Unit ID 1
gen_2522	Generator	Gen YCAST1 13.8 Unit ID 1
gen_2523	Generator	Gen YUCCACT1 13.2 Unit ID 1
gen_2524	Generator	Gen YUCCACT2 13.2 Unit ID 1
gen_2525	Generator	Gen YUCCACT3 13.8 Unit ID 1
gen_2526	Generator	Gen YUCCACT4 13.8 Unit ID 1
gen_2527	Generator	Gen YUCCACT5 13.8 Unit ID 1
gen_2528	Generator	Gen YUCCACT6 13.8 Unit ID 1
gen_2529	Generator	Gen YUCCAGEN 13.8 Unit ID 1
gen_2530	Generator	Gen AVSOLAR2_48 0.5 Unit ID 1

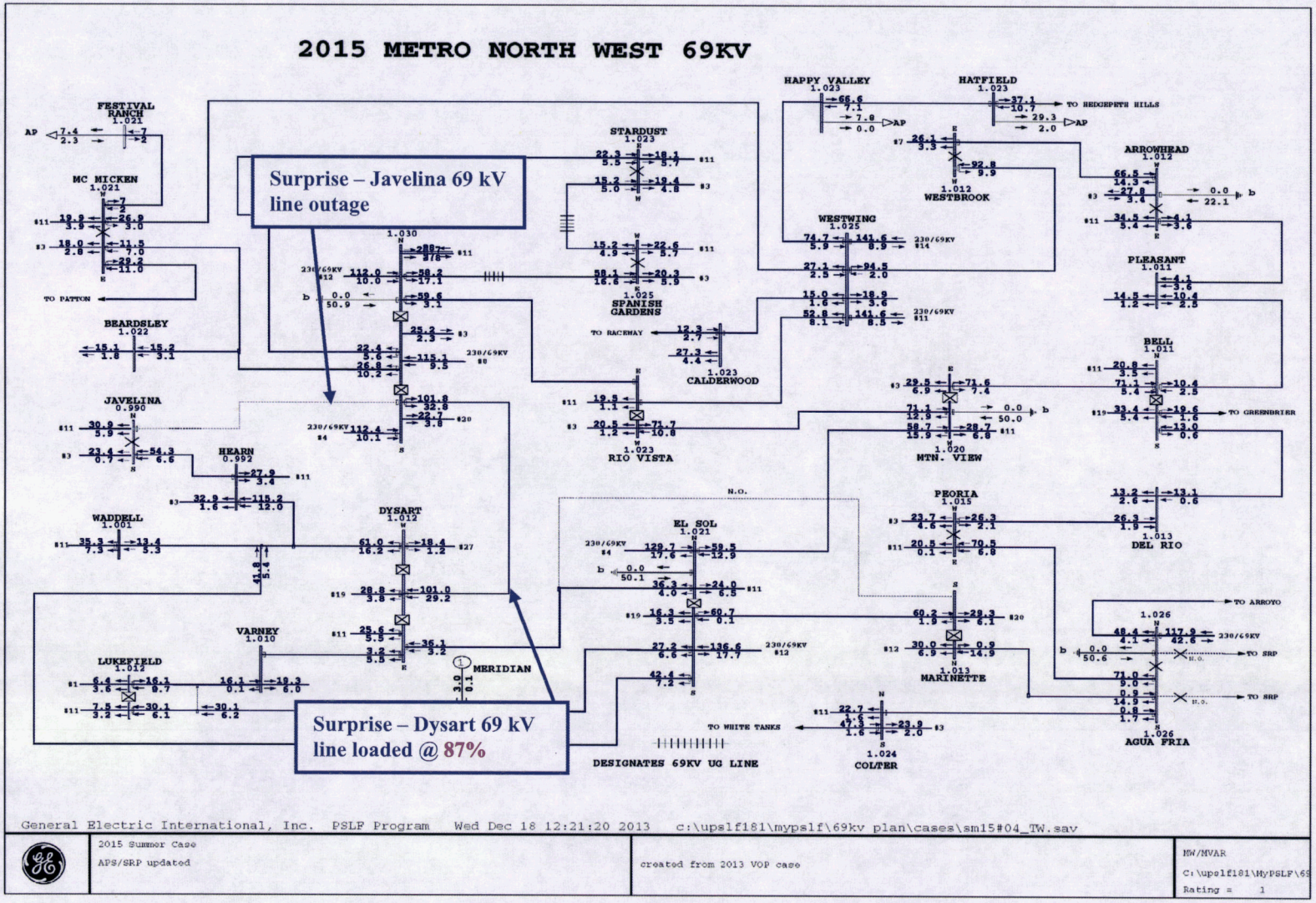
APPENDIX B

Power Flow Maps for Security Needs Projects

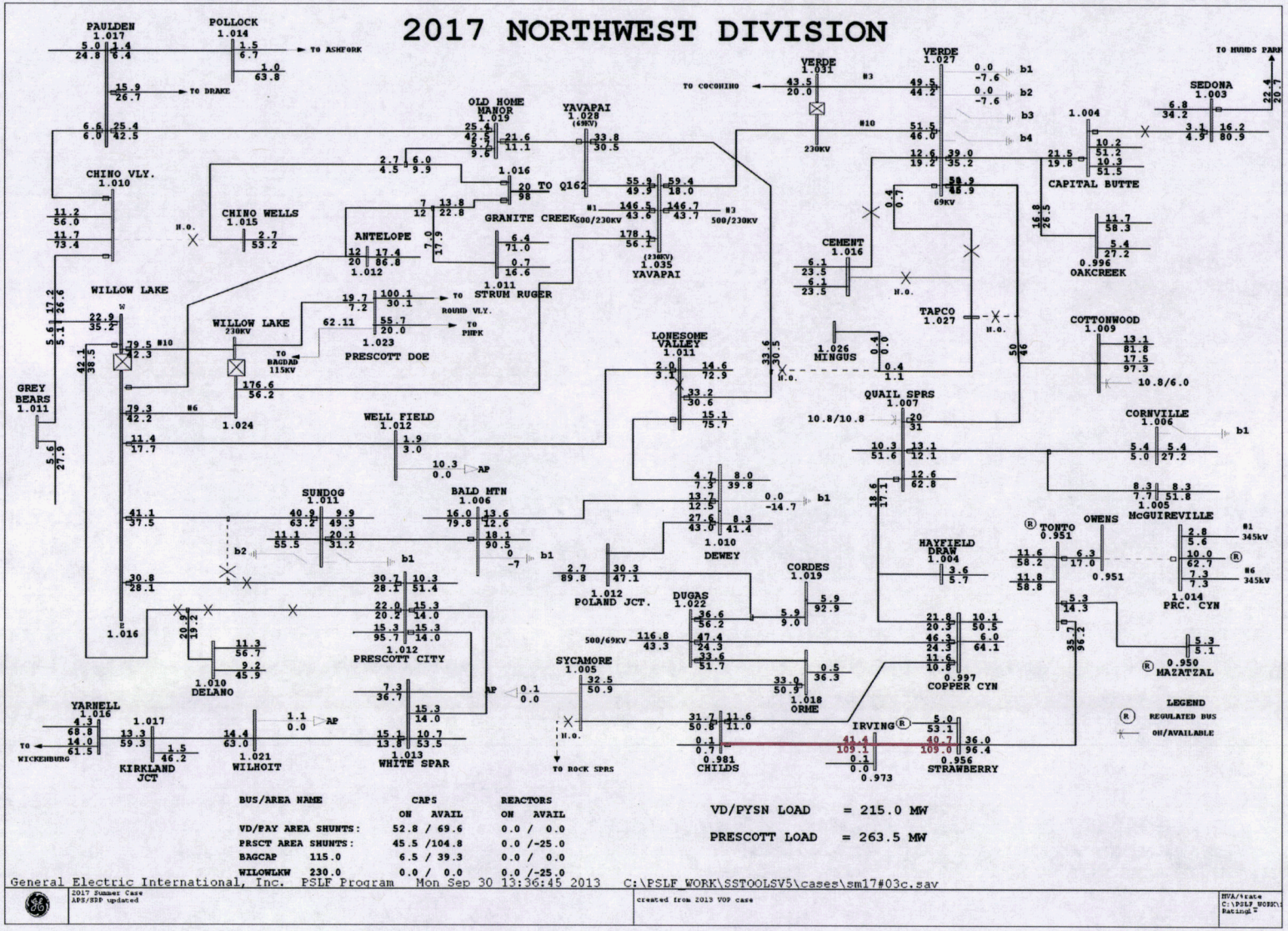
Javelina – Surprise 69kV Outage <u>without</u> Trilby Wash 230/69kV Substation (2015)



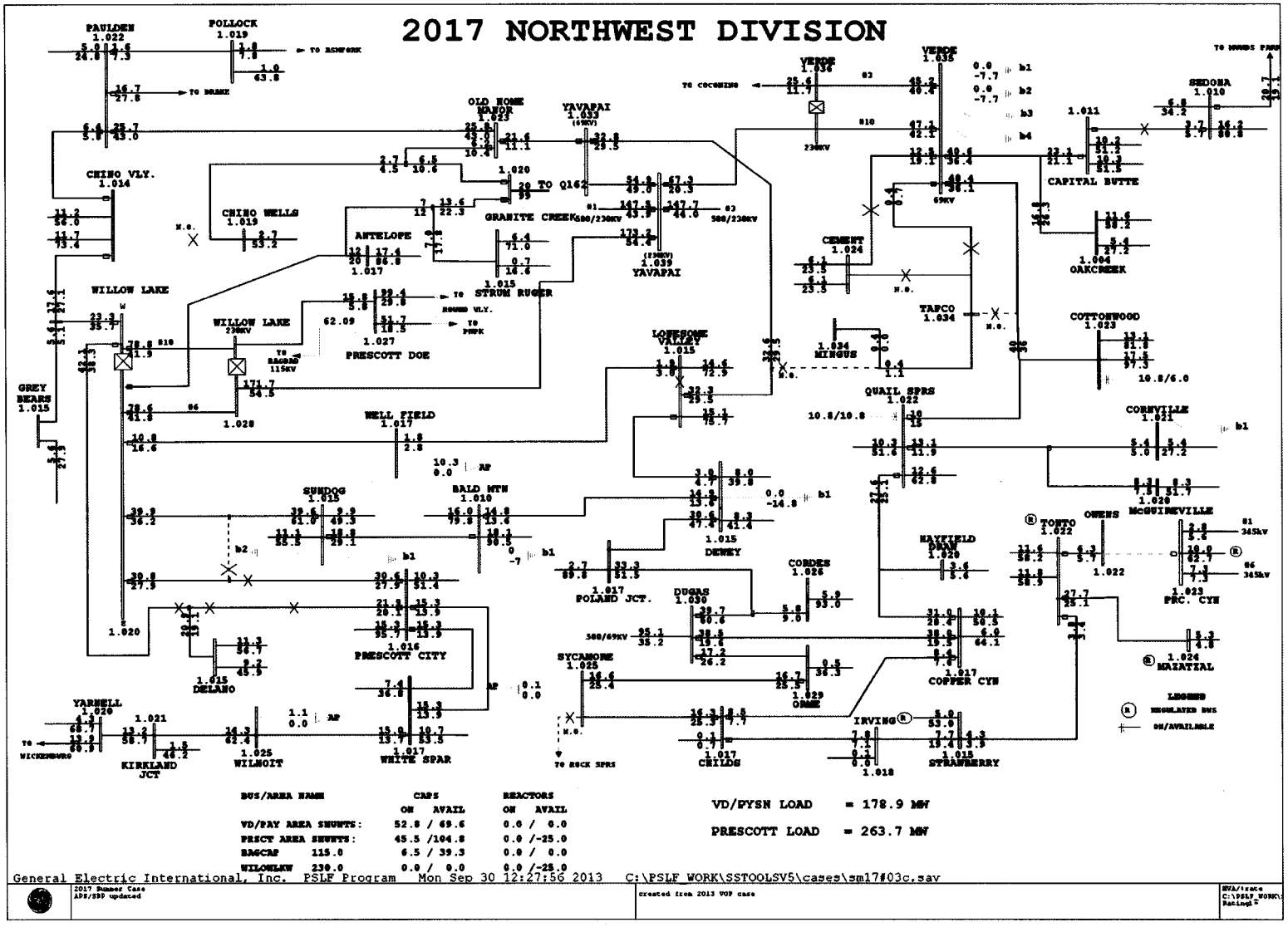
Javelina – Surprise 69kV Outage <u>with</u> Trilby Wash 230/69kV Substation (2015)



Preacher Canyon – Owens – Tonto 69kV Outage without Mazatzal 345/69kV Substation (2017)



Preacher Canyon – Owens 69kV Outage with Mazatzal 345/69kV Substation (2017)



APPENDIX C

2018
Transient Stability Contingency List

Transmission Circuits		
From	**To**	**Voltage**
Abel	Pinal Central	500
Arlington	Hassyampa	500
Avery	Scatterwash	230
Avery	Raceway	230
Cedar Mountain	Yavapai	500
Cholla	Four Corners 1	345
Cholla	Four Corners 2	345
Cholla	Mazatzal	345
Cholla	Preacher Canyon	345
Cholla	Saguaro	500
Cholla	Sugarloaf	500
Colorado River	Palo Verde	500
Coronado	Sugarloaf	500
Coronado	Silverking	500
Coronado	Springerville	345
Crystal	Navajo	500
Country Club	Grand Terminal	230
Delany	Sun Valley	500
Dugas	Morgan	500
Dugas	Navajo	500
Four Corners	Moenkopi	500
Four Corners	San Juan	345
Gila River	Jojoba 1	500
Gila River	Jojoba 2	500
Gila River	Jojoba	230
Glen Canyon	Flagstaff 1	345
Glen Canyon	Flagstaff 2	345
Glendale	Grand Terminal	230
Hassyampa	Hoodoo Wash	500
Hassyampa	Jojoba	500
Hassyampa	North Gila	500
Hassyampa	Pinal West	500
Hoodoo Wash	North Gila	500
Jojoba	Kyrene	500
Jojoba	TS4	230

Kyrene	Browning	500
Liberty	Peacock	345
Moenkopi	Cedar Mountain	500
Moenkopi	El Dorado	500
Moenkopi	Yavapai	500
Morgan	Sun Valley	500
Morgan	Pinnacle Peak	500
Morgan	Westwing	500
Navajo	Moenkopi	500
Palm Valley	TS2	230
Palo Verde	Delany	500
Palo Verde	Devers	500
Palo Verde	Hassyampa 1	500
Palo Verde	Hassyampa 2	500
Palo Verde	Hassyampa 3	500
Palo Verde	Rudd	500
Palo Verde	Westwing 1	500
Palo Verde	Westwing 2	500
Pinnacle Peak	Flagstaff 1	345
Pinnacle Peak	Flagstaff 2	345
Pinnacle Peak	Mazatzal	345
Pinnacle Peak	Preacher Canyon	345
Pinnacle Peak	Reach	230
Pinnacle Peak	Lonepeak	230
Pinnacle Peak	Cactus	230
Pinnacle Peak	Ocotillo	230
Pinnacle Peak C	Pinnacle Peak E	230
Pinnacle Peak C	Pinnacle Peak W	230
Pinnacle Peak E	Pinnacle Peak N	230
Pinnacle Peak (SRP)	Pinnacle Peak 1 (APS)	230
Pinnacle Peak (SRP)	Pinnacle Peak 2 (APS)	230
Saguaro	Tortolita 1	500
Saguaro	Tortolita 2	500
Silverking	Browning	500
Sun Valley	Trilby Wash	230
Westwing	Perkins	500
Westwing	Yavapai	500
Westwing	Pinal West	345

Transformers		
Bus	**High**	**Low**
Cholla 1	500	345
Cholla 2	500	345
Cholla 1	345	230
Cholla 2	345	230
Four Corners 1	345	230
Four Corners 2	345	230
Four Corners	500	345
Gila River	500	230
Kyrene 6	500	230
Kyrene 7	500	230
Kyrene 8	500	230
Morgan	500	230
Pinnacle Peak 1	500	230
Pinnacle Peak 2	500	230
Pinnacle Peak 3	500	230
Pinnacle Peak 1	345	230
Pinnacle Peak 2	345	230
Pinnacle Peak 3	345	230
Pinnacle Peak 1 (WAPA)	345	230
Pinnacle Peak 2 (WAPA)	345	230
Pinnacle Peak 3 (WAPA)	345	230
Rudd 1	500	230
Rudd 2	500	230
Rudd 3	500	230
Rudd 4	500	230
Sun Valley 1	500	230
Westwing 1	500	230
Westwing 2	500	230
Westwing	500	345
Yavapai 1	500	230
Yavapai 2	500	230

Generators	
Generator	**Terminal Bus**
Cholla 4	22
Four Corners 5CC	22
Gila River ST1	18
Navajo 2	26
Ocotillo ST2	13.8
Palo Verde 1	24
Redhawk CT2 & ST1	18
Saguaro CT3	13.8
Sundance G3 & G4	13.8
West Phoenix North 5CT2	15
West Phoenix South CC1	13.8
Yucca CT3	13.8

Plots provided upon request

APPENDIX D

2021
Transient Stability Contingency List

Transmission Circuits		
From	**To**	**Voltage**
Abel	Pinal Central	500
Arlington	Hassyampa	500
Avery	Scatterwash	230
Avery	Raceway	230
Cedar Mountain	Yavapai	500
Cholla	Four Corners 1	345
Cholla	Four Corners 2	345
Cholla	Mazatzal	345
Cholla	Preacher Canyon	345
Cholla	Saguaro	500
Cholla	Sugarloaf	500
Coronado	Sugarloaf	500
Coronado	Silverking	500
Coronado	Springerville	345
Crystal	Navajo	500
Country Club	Grand Terminal	230
Delany	Sun Valley	500
Devers	Palo Verde	500
Dugas	Morgan	500
Dugas	Navajo	500
Four Corners	Moenkopi	500
Four Corners	San Juan	345
Gila River	Jojoba 1	500
Gila River	Jojoba 2	500
Gila River	Jojoba	230
Glen Canyon	Flagstaff 1	345
Glen Canyon	Flagstaff 2	345
Glendale	Grand Terminal	230
Hassyampa	Hoodoo Wash	500
Hassyampa	Jojoba	500
Hassyampa	North Gila	500
Hassyampa	Palo Verde	500
Hassyampa	Pinal West	500
Hoodoo Wash	North Gila	500
Jojoba	Kyrene	500

Jojoba	TS4/Liberty	230
Kyrene	Browning	500
Liberty	Peacock	345
Mazatzal	Pinnacle Peak	345
Moenkopi	Cedar Mountain	500
Moenkopi	El Dorado	500
Moenkopi	Yavapai	500
Morgan	Sun Valley	500
Morgan	Pinnacle Peak	500
Morgan	Westwing	500
Navajo	Moenkopi	500
Palm Valley	TS2/Trilby Wash	230
Palo Verde	Delany	500
Palo Verde	Devers	500
Palo Verde	Hassyampa 1	500
Palo Verde	Hassyampa 2	500
Palo Verde	Hassyampa 3	500
Palo Verde	Rudd	500
Palo Verde	Westwing 1	500
Palo Verde	Westwing 2	500
Pinnacle Peak	Flagstaff 1	345
Pinnacle Peak	Flagstaff 2	345
Pinnacle Peak	Mazatzal	345
Pinnacle Peak	Preacher Canyon	345
Pinnacle Peak	Reach	230
Pinnacle Peak	Lonepeak	230
Pinnacle Peak	Cactus	230
Pinnacle Peak	Ocotillo	230
Pinnacle Peak C	Pinnacle Peak E	230
Pinnacle Peak C	Pinnacle Peak W	230
Pinnacle Peak E	Pinnacle Peak N	230
Pinnacle Peak (SRP)	Pinnacle Peak 1 (APS)	230
Pinnacle Peak (SRP)	Pinnacle Peak 2 (APS)	230
Saguaro	Tortolita 1	500
Saguaro	Tortolita 2	500
Silverking	Browning	500
Sun Valley	Trilby Wash	230
Westwing	Perkins	500

Westwing	Yavapai	500
Westwing	Pinal West	345

Transformers		
Bus	**High**	**Low**
Cholla 1	500	345
Cholla 2	500	345
Cholla 1	345	230
Cholla 2	345	230
Four Corners 1	345	230
Four Corners 2	345	230
Four Corners	500	345
Gila River	500	230
Kyrene 6	500	230
Kyrene 7	500	230
Kyrene 8	500	230
Morgan	500	230
Pinnacle Peak 1	500	230
Pinnacle Peak 2	500	230
Pinnacle Peak 3	500	230
Pinnacle Peak 1	345	230
Pinnacle Peak 2	345	230
Pinnacle Peak 3	345	230
Pinnacle Peak 1 (WAPA)	345	230
Pinnacle Peak 2 (WAPA)	345	230
Pinnacle Peak 3 (WAPA)	345	230
Rudd 1	500	230
Rudd 2	500	230
Rudd 3	500	230
Rudd 4	500	230
Sun Valley 1	500	230
Westwing 1	500	230
Westwing 2	500	230
Westwing	500	345
Yavapai 1	500	230
Yavapai 2	500	230

Generators	
Generator	**Terminal Bus**
Cholla 4	22
Four Corners 5CC	22
Gila River ST1	18
Navajo 2	26
Ocotillo ST2	13.8
Palo Verde 1	24
Redhawk CT2 & ST1	18
Saguaro CT3	13.8
Sundance G3 & G4	13.8
West Phoenix North 5CT2	15
West Phoenix South CC1	13.8
Yucca CT3	13.8

Plots provided upon request

Attachment B

Arizona Public Service Company
Renewable Transmission Action Plan
January 2014

In the Fifth Biennial Transmission Assessment ("BTA") Decision, (Decision No. 70635, December 11, 2008), the Arizona Corporation Commission ("ACC" or "Commission") ordered Arizona Public Service Company ("APS" or "Company") to file a document identifying their top potential Renewable Transmission Projects ("RTPs") that would support the growth of renewable resources in Arizona. As such, on January 29, 2010, APS filed with the Commission its top potential RTPs, which were identified in collaboration with Southwest Area Transmission planning group ("SWAT") and its subgroups, other utilities and stakeholders. In its filing, APS included a Renewable Transmission Action Plan ("RTAP"), which included the method used to identify RTPs, project approval and financing of the RTPs.

On January 6, 2011, the Commission approved APS's RTAP (Decision No. 72057, January 6, 2011[1]), which allows APS to pursue the development steps indicated in the APS RTAP. The Decision, in part, ordered:

> *IT IS FURTHER ORDERED that the timing of the next Renewable Transmission Action Plan filing shall be in parallel with the 2012 Biennial Transmission Assessment process.*
>
> *IT IS FURTHER ORDERED that Arizona Public Service Company shall, in any future Renewable Transmission Action Plans filed with the Commission, identify Renewable Transmission Projects, which include the acquisition of transmission capacity, such as, but not limited to, (i) new transmission line(s), (ii) upgrade(s) of existing line(s), or (iii) the development of transmission project(s) previously identified by the utility (whether conceptual, planned, committed and/or existing), all of which provide either:*
>
> 1. *Additional direct transmission infrastructure providing access to areas within the state of Arizona that have renewable energy resources, as defined by the Commission's Renewable Energy Standard Rules (A.A.C. R14-2-1801, et seq.), or are likely to have renewable energy resources; or*
> 2. *Additional transmission facilities that enable renewable resources to be delivered to load centers.*

Renewable expansion in the APS service territory has been trending toward the development of smaller scale renewable projects. APS has received many interconnection requests for these smaller projects, which interconnect directly into the local distribution system (230kV or below) rather than APS's high voltage transmission system. Development of large scale renewable projects, which drive the need for new RTPs, has reduced dramatically since the time the APS RTAP was filed - as demonstrated by the fact that APS has received only a few transmission system interconnection requests within the last two years.

The APS 2014-2023 Ten-Year Transmission System Plan does not show a need for additional RTPs beyond what the Commission previously approved in Decision No. 72057. As a result, in this RTAP, APS is not proposing new RTPs. As the

[1] Commission Decision No. 72057 found that APS's 2010 RTAP process and Plan is appropriate and consistent with the Commissions' Fifth Biennial Transmission Assessment final order.

Arizona Public Service Company
Renewable Transmission Action Plan
January 2014

development of large renewable energy projects evolves, APS will explore new renewable transmission opportunities.

The RTPs that APS filed in its original RTAP continue to be viable and will be developed as reliability and resource needs arise. The following section describes the RTPs (approved by the Commission in Decision No. 72057), the development approach and schedule for each, the expected cost for each, and the current status of each RTP.

1. **Proposed development plan for a potential Delaney to Palo Verde 500kV project**

   Description: This project is one section of the Palo Verde to Sun Valley 500kV transmission line project that APS will need to import various generation resources to the Phoenix area load center. It is an integral piece to APS's 500kV infrastructure backbone in the greater Phoenix area. It also is an important component to the potential Devers II transmission project as the project establishes the Delaney switchyard. The Delaney switchyard has been identified as the starting point for the Devers II transmission project, which would provide a connection to the Southern California markets, and has the potential to enable additional renewable energy to be exported from Arizona to California.

   Development Approach and Schedule: APS is pursuing the land and Right-of-Way acquisition, engineering, and construction necessary for this project. The project development activities were adjusted to accommodate the pace of renewable energy development in the area. The actual in-service date of this project may be aligned with the first definitive use of the line. This could include an APS Purchased Power Agreement with a developer at Delaney or a committed Transmission Service Agreement with a developer selling to another utility.

   Expected Cost: APS estimates the Company's portion of the project to cost approximately $60 million.

   Current Status: APS acquired a Certificate of Environmental Compatibility ("CEC") for the project (Decision No. 68063, August 17, 2005). APS has almost completed the land and right-of-way acquisition, design, and engineering for the project. The site preparation, grading and foundations at the Delaney switchyard have been completed. Also, APS is proceeding with engineering and construction of the new bay at the Palo Verde switchyard. In previous Ten-Year plans, APS had scheduled the project to be in-service in 2013, which assumed a firm resource development to utilize the project. Without that development, the 2014 10 Year Plan shows an in-service date of 2016 to coincide with APS's need date for Sun Valley. Currently, APS has one solar generation interconnection request at the Delaney switchyard. The earliest requested interconnection date for this project is 2016.

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2. Proposed development plan for a Palo Verde to North Gila 500kV #2 project

Description: The Palo Verde to North Gila transmission project is a potential 500kV transmission line from the Palo Verde hub area to the North Gila Substation, which is located outside of Yuma. This project will help serve the Yuma area as it will increase APS's ability to deliver various resources and increase APS's load serving capability to the load center in Yuma. The area has excellent solar conditions, which should result in comparably good pricing of solar resources. This line could enable APS to bring additional geothermal resources to APS customers from Imperial Valley in California as well as provide an opportunity for Arizona to export renewable energy.

Development Approach and Schedule: APS continues to work toward an in-service date of 2015 for this project. APS initiated the development of this line to increase the load serving capability for, and to deliver resources to, the Yuma load center. At this time APS is the only participant in this project. However, there are discussions taking place between APS and other potential participants.

Estimated Cost: APS estimates the cost of the project will be approximately $187 million.

Current Status: APS has acquired a CEC for the project in Commission Decision No. 70127 (January 23, 2008). APS has nearly completed the land and right-of-way acquisition, design, and engineering for the project. Material acquisition and construction activities began in mid-2013, and the line is on track for an expected in-service date of 2015.

3. Proposed development plan for a Palo Verde to Liberty and Gila Bend to Liberty projects

Description: The Palo Verde to Liberty and Gila Bend to Liberty are conceptual 500kV transmission line projects from the Palo Verde hub and from the Gila Bend/Gila River area to a new substation near the existing Liberty substation located in the west valley.

Current Status: The APS 2014 Ten-Year Plan Study does not show a need for these projects and, as a result, no further progress on the development plan has been made. This is primarily due to downturn in the economy and lack of renewable energy development in the area. APS will revisit these projects when renewable energy development increases in the area.